NATIVE WINES.

ISIDOR BUSH & CO.

WINE CELLARS,

AND

Champagne Depot,

S. E. CORNER FOURTH AND ELM STREETS,

ST. LOUIS, MO.

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ELVIRA

FROM NATURE FOR THE BUSHBERG CATALOGUE,

Jno. McKittrick & Co. Chromo Lith.

SB389
.I55
1875

ILLUSTRATED

DESCRIPTIVE CATALOGUE

OF

American Grape-vines,

WITH

BRIEF DIRECTIONS FOR THEIR CULTURE.

BY

BUSH & SON & MEISSNER,

Successors to ISIDOR BUSH & SON, } GRAPE GROWERS, { *And* PROPRIETORS OF THE

Bushberg Vineyards & Grape Nurseries,

BUSHBERG, JEFFERSON CO., MO.

Transferred
1869.

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THE R. P. STUDLEY CO., PRINTERS, LITHOGRAPHERS, AND MANUFACTURING STATIONERS.
1875.

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D. G. Leydecker
from the author

BUSHBERG

Vitis Oz. G. Leyden p. 4-7

CATALOGUE

ILLUSTRATED

DESCRIPTIVE

BUSH & SON & MEISSNER,

BUSHBERG, Jefferson Co.

MISSOURI.

April 1875

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ELVIRA

FROM NATURE FOR THE BUSHBERG CATALOGUE,

Jno. McKittrick & Co. Chromo Lith.

TO OUR CUSTOMERS.

[FROM FIRST EDITION, 1869.]

Our success in grape growing, and in the propagation of grape vines, has been highly satisfactory, in fact, far beyond our expectations. In view of the very great competition even of large well known and long established nurseries, this success is highly flattering, and has encouraged us to increase our efforts so as to produce for next season a large stock, not excelled by any other establishment in the country in quality, and embracing almost every valuable variety.

We do *not* pretend to furnish "*better and cheaper* vines than can be afforded by any other establishment." We do *not* pretend that "money-making is secondary with us," we leave this to others; all we *do* claim is, that we hope to *merit* a reasonable share of patronage, the continued confidence of our customers, and a fair profit.

In this connection, we cannot refrain from referring with a certain pride to the voluntary assurances of satisfaction we received, some of which are published herewith. Desiring to return our thanks to our customers in an appropriate and tangible form, and to respond to a desire often expressed by our correspondents, we concluded to present them with a fine *Illustrated and Descriptive Catalogue*, wherein the characteristic and relative merits of our different varieties are clearly stated.

We leave it to others to judge of its merits. We tried to get up something better than a mere price list, something that will be interesting and useful to progressive grape culturists, and have not spared time, labor or money in preparing it.

It has become customary to prefix to a descriptive Catalogue of fruits and flowers some brief directions for their cultivation, and we have been urged to do the same.

We are aware, however, that some short and very incomplete directions, "a few hints," do more harm than good. They generally only confuse the tyro or misrepresent grape growing as a very easy matter, requiring no larger outlay of capital, nor any more knowledge, skill, and labor than to produce a crop of corn. This we do *not* wish to do. But on the other hand we are also aware that the excellent but somewhat costly books on grape culture, by Fuller, Husmann, Strong, and others, are not purchased by every grape grower, and that many of these are somewhat afraid of reading whole books. Moreover, considerable progress has been made in grape culture since these books were written; their very authors, indefatigable horticulturists as they are, have by study and experience, modified their views on some points, but have not had time or encouragement enough from their publishers to rewrite their works for new editions, and thus we came to the conclusion that a short manual, containing plain but full directions in regard to the planting, culture, and training of Grape-vines, and offered for less than its cost, would be welcome. We have availed ourselves of the writings of our friend and teacher, Husmann, and of the works of Downing, Fuller, and many others, to whom due credit is given in the proper places; and while we lay little claim to originality, we hope that this Catalogue may afford pleasure and profit to some, at least, of those into whose hands it may come.

[INTRODUCTION TO NEW EDITION—1875.]

Six years, embracing the most disastrous and the most favorable seasons to grape culture, have elapsed since the first edition of this Catalogue. Our experience has been enriched, observations have been made on old, and on then untried varieties, and some very promising *new varieties* have since been added to our list, but above all, one circumstance, the discovery of the Grape Root-louse, the Phylloxera, has led to a new, a RADICAL study of the American Grape Vines.

Our business as grape growers and propagators assumed such large dimensions that we discarded the culture and propagation of small fruits &c., and devoted all the space of our grounds, all our means, cares and attention to GRAPE CULTURE ONLY AND EXCLUSIVELY, for which we have unusual facilities, and a most favorable soil and location. This enables us to raise a superior stock, and to make it more advantageous to the public, and even to the leading nurseries of other branches of Horticulture, to deal with us, whose grape nursery business is now admitted to be the first and most extensive of its kind in the United States of America.

We owe our reputation to our determination to give complete satisfaction, and to deserve the entire confidence of our customers, furnishing none but good, healthy, genuine plants, unmixed, and true to name, packed in the best manner, at as low prices as possible.

We have no seedlings of our own, and impartially

recommend such varieties only, new or old, as have real superior merit, and while the demand compels us to disseminate some inferior varieties (*Hartford Prolific* for instance) and untried novelties, over-praised, perhaps, by their originators, our Descriptive Catalogue shall save the reader from some of the bitter disappointments which grape growers have so often experienced. For the sake of completeness, and in the interest of science, we have added, (in smaller type) the descriptions of nearly all the old discarded varieties and of many new ones not yet tested, and not propagated by us; thus adding, we think, to the value of this catalogue (though also to its cost).

We have carefully endeavored to avoid all undue praise, and to mention the shortcomings even of our best varieties; especially do we desire to warn against the error of considering ANY variety fit for universal cultivation. To this end a study of the CLASSIFICATION of our grapes in the *Manual* is earnestly recommended. Many failures will thus be avoided which have blasted the hopes, so prevalent ten years ago throughout the country, with regard to grape culture; and its *success*, now aided by a higher tariff on imported wines, by increased demand for the fruit and its products, by less sanguine expectations, and above all by better knowledge as to the selection of varieties, locations, and proper mode of culture, will be comparatively certain.

Finally we beg to state that WE HAVE NO AGENTS to solicit orders for our Grape Vines. Persons who desire to obtain plants from us will kindly favor us with their orders by mail, *direct*, or through *reliable* Nurseries or dealers who get them from us.

TESTIMONIALS.

We could give a long list of names of the leading Grape-growers and Nurserymen, and of the prominent Horticulturists, in this country as well as in Europe, who favored us with their commands, and to whom we may confidently refer; but we flatter ourselves that our name is now so widely known, and our reputation so well established, that this would be unnecessary, and we confine ourselves to but *a few*

EXTRACTS FROM LETTERS OF OUR CUSTOMERS.

[FROM OUR FIRST EDITION.]

ST. CHARLES, MO., Nov. 9th, 1868.

MESSRS. BUSH & SON:

Gentlemen:—Hundred Rogers No. 1 came duly to hand; also your favor of 5th inst. *The vines are fine.*

C. T. MALLINCKRODT.

ARLINGTON, MO., MARCH, 1869.

THE vines I got of you last fall were the best I ever saw sent out from a nursery—stout, healthy looking, and excellently well rooted. C. W. GILL.

COLLINSVILLE, ILLS., NOV. 14. 1869.

Dear Sir:—The 180 Hartford grape roots came to hand a few days since, and were finer than any grape plants I have received from any one whom I have yet got grape roots of. In a word, they were fine.

GEO. A. MILLER.

CENTRAL POSTOFFICE, ST. LOUIS CO., MO, JULY 30, '69.

The plants purchased of your firm this spring, comprising ten different varieties to the number of 3,000, have given very good satisfaction. They have all proved to be vigorous growers and give promise of complete success for the future. CHAS. BRACHES.

"SPRINGFIELD NURSERY," SPRINGFIELD, MO., APRIL 10 '69.

Gentlemen:—I have just finished planting the 4,000 grape vines you sold me last November. They were shipped so late I had some fear of frost, but they were so *well packed* that they arrived in the very best condition, giving satisfaction in *Quality* also, for the whole lot are healthy, well rooted vines D. S. HOLMAN.

WESTON, MO., April 30, 1869.

Dear Sirs:—The shipment of vines came to hand about the 5th of the month and have been all planted. They were delayed over ten days on the railroad, and I feared some of them might have been injured, but I am gratified to inform you they have nearly all lived and look well. The very low prices at which you sell such thrifty vines ought to recommend you to the grape growers of the State. JNO. DONIPHAN.

[FROM LAST SEASON, 1874.]

BUSH & SON & MEISSNER:

Your invoice of March 1st came safely to hand. The vines are all in best condition, and growing vigorously.

LOUIS REICH, Arles-S-Rhone, France.

It gives me pleasure to say that everybody concerned was well satisfied with the quality of the plants, and all unite in the request that you will send us the balance ordered without delay

W. W. MINOR, JR., Charlottesville, Va.

The vines give entire satisfaction. I don't know when I haveseen more beautifully rooted plants: the tops are quite large enough and healthy. You have equalled all my expectations, * * * * you give *decidedly* the best vines for the price I ever heard of.

C. W. RIDGELY, Baltimore, Md.

Genl. Lippincott received the 400 grape vines; he is very much pleased with the plants.

J. M. TELLES, Chandlersville, Cass Co., Ills.

The grape vines received in good order. I am much pleased with them, I must say they are the finest lot of vines I have ever received

HUGH ARCHIBALD, West Salem, Ills.

The grape vines ordered from you reached me to day in first rate condition. They are of excellent quality, the best I have ever received. Allow me to express my satisfaction with the manner in which the order was filled.

RICHARD T. ALLISON, Baltimore, Md.

I liked the plants, and how they compared in quality with plants from * * *

N. N. PALMER, Broadhead, Wisc.

The vines received this spring are splendid, and every one growing.

HARRY C. CAMPBELL, Pensacola, Fla.

All are well pleased with the vines; you have my best thanks.

DAVID ZWEIFEL, Nillwood, Ills.

The vines which I had from you last spring all grew magnificently.

M. WUTHRICH, Egg Harbor City, N. J.

The vines came promptly to hand; I am well pleased. They are finer ones than I expected for the price.

AMOS S. COLLINS, Carrolton, La.

The grape plants gave good satisfaction, and arrived in splendid condition.

J. P. BRUBAKER, Wachusa, Ills.

I take pleasure to tell you that the plants received from you last spring all look very healthy, and are making fine growth. I am proud to be able to recommend your establishment to all my friends.

FR. BETZ, Lawrence, Kas.

The vines you sent me this fall are all first class in every respect.—Send me your descriptive catalogue as soon as it is out.

JOHN MAUPIN, Mt. Sterling, Ky.

GRAPE MANUAL.

CLIMATE, SOIL, AND ASPECTS.

Whether the Grape-vine is a native of Asia, and has followed the footsteps of man from the shores of the Caspian Sea, and "intertwined its tendrils with civilization and refinement in every age," or whether the hundreds of varieties that now exist spring from different primodial forms or species, certain it is that, although the Grape-vine may be found in Europe from the Tropic of Cancer to the Baltic Sea, and in America from the Gulf to the Lakes, the vine is nevertheless peculiarly the growth of definite climatic conditions; so much so that even in its most adapted climate there are often seasons if not of actual failure, at least of an imperfect development of its fruit. From long and careful observations of temperature and moisture in years of success and of failure, we have finally arrived at some definite conclusions respecting the meteorological influences affecting the grape.*

1st. No matter how excellent the soil, if there is a less average than fifty-five degrees of temperature for the *growing* months of April, May and June, and a less average than sixty-five degrees for the *maturing* months of July, August and September, there can be no hope of success; and where the temperature averages sixty-five degrees for the former months and seventy-five degrees for the latter, other conditions being equal, fruit of the greatest excellence can be raised, and wine of the greatest body and finest excellence can be produced.

2d. When there is an average rain fall of six inches for the months of April, May and June, and an average of five inches for the months of July, August and September, other conditions favorable, we cannot succeed in raising grapes. When the average rainfall for the first months is not more than four inches, and the average for the latter is not more than three inches, other conditions favorable, the *hardy* varieties can be cultivated with success. But where there is less average rainfall than five inches for April, May and June, and a less average than two inches in July, August and September, all other conditions being favorable, fruit of the best quality can be raised, and wine of the greatest body and excellence can be made. The humidity of the atmosphere in some countries, the dryness of the air in others, will, of course, materially change the proportion of rainfall required for or injurious to the grape. Here, a clear sky and dry atmosphere, high temperature and very little rainfall for the latter three months, and a less change of temperature than 50 degrees in twenty-four hours, any time of the year, are the most favorable conditions for success.

There are only a few countries where the grape will, in favorable seasons, grow to perfection, and there is no country in the world where *all* kinds of grapes would succeed. Species found in the lower latitudes will not flourish if removed further north; the natives of higher latitudes will not endure the southern heat; the Scuppernong cannot ripen north of Virginia; the fox grape of the North will scarcely grow in the lower regions of Carolina and Georgia; a vine which produces delicious grapes in Missouri may become very inferior in the most favored localities of New Hampshire.

* James S. Lippincott: Climatology of American Grapes.—*Id* Geography of Plants —*U. S. Agr. Reports*, 1862 and 1863.—Dr. J. Stayman: The Meteorological Influences affecting the Grape.

Thus the climate, the mean temperature as well as the extremes, the length of the growing season, the relative amount of rain, the ameliorating influence of lakes and large rivers, the altitude as well as the soil, have an almost incredible influence on various varieties of grapes; and a judicious choice of locations adapted to the grape, and of varieties adapted to our location, its climate and soil, is therefore of the first importance.

Unfortunately, this has been and is even now but insufficiently understood. Indigenous wild grapes were found at the discovery of this new world; the legend tells us that when the Normans first discovered this country "Hleif Ericson" called the land *Wineland.* As early as 1564 wine was made by the first colonists from the native grape in Florida. Thus during the previous centuries wine has occasionally been made in America from native grapes, and mention of it is found—(the French settlers near Kaskaskia, Ill., made, in 1769, one hundred and ten hogsheads of strong wine from wild grapes) —"but neither the quality of the wine nor the price obtained for it offered sufficient inducement to persevere."—*Buchanan.*

The European grape, *Vitis Vinifera*, was, therefore, considered the only true wine grape. A London Company sent, in 1630 French vignerons into the Virginia Colony to plant grapevines which they had imported for the purpose; the poor vignerons were blamed for their failure. In 1633 Wm. Penn tried to introduce and cultivate European varieties in Pennsylvania, in vain. In 1690 a Swiss Colony, grape growers from the Lake of Geneva, tried to raise grapes and make wine in Jessamine Co., Ky., but their hopes were soon frustrated, their labor and fund—$10,000, a large amount in those days—were lost; and only when they commenced to cultivate an indigenous grape, which they however supposed to be from the Cape, (see *Alexander*) they had somewhat better success. The attempts with German, French, and Spanish vines, made again and again, proved failures. Hundreds of thousands, (comprising many different sorts) of the best European vines were imported, but they all perished "from the vicissitudes of the climate." Thousands of failures are recorded; not one of durable success; and Downing was fully justified in saying: (*Horticulturist*, Jan. 1851) "The introduction of the foreign grape in this country for open vineyard culture *is impossible.* Thousands of individuals have tried it—the result in every case has been the same; a season or two of promise, then utter failure." (Always excepting California, which was then almost unknown, but which is now the greatest wine-producing State of this country. All our remarks on grape culture refer only to the States east of the Rocky Mountains.)

While this fact could not be denied, the cause remained a mystery. All pronounced the European grape as "unsuited to our soil and climate;" all attributed its failure to that cause. But we, and doubtless many others with us, could not help thinking that "soil and climate" cannot be the sole causes; for this vast country of ours possesses a great many locations where soil and climate are quite similar to that of some parts of Europe at least, where the Vinifera flourishes; is it then reasonable to suppose that none of the many varieties which are grown in Europe under so varied climatic conditions, from Mainz to Naples, from the Danube to the Rhone, should find a congenial spot in these United States, embracing almost every climate of the temperate zone? If soil and climate were so unsuited, how is it that the young, tender European vines grow so well, so promising of success, for a few seasons; in large cities sometimes even for several years? How explain the fact that the finest European varieties of other fruits, the pear for instance, are successfully grown here, and that, but for the curculio, the Reine Claude and German Prunes would flourish here as well as there? Slight differences of soil and climate might well produce marked differences in the constitution of the vine, perhaps also somewhat in the flavor and quality of the grapes, but could not sufficiently account for their absolute failure. Nevertheless our learned Horticulturists looked for no other cause, they went even so far as to teach that "if we really wished to *acclimate* the foreign grape here, we must go to the seeds and raise two or three new generations in the American soil and climate." In obedience to these teachings numerous fruitless attempts have been made to raise here seedlings of the European grape that will *endure our climate.* Like their parents, they seemed successful for a time *—to be soon discarded and

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* Among the seedlings of foreign grapes, raised in the U. S., which obtained a name and fame, are: *Brinkle* and *Emily*, raised by Peter Raabe of Philadelphia; *Brandywine*, originated near Wilmington, Del.; *Katarka* and *Montgomery*, or Merritt's Seedling, raised by Dr W A. Royce, of Newburg, N Y. To these belong also *Clara* and *Weehawken* (see description). N. Grein, near Hermann, Mo., raised during these last years hundreds of young vines from imported Riesling seed; nearly all of them were barren, one, however, proved so far, sufficiently prolific and free from disease to allow its originator to make some wine from its fruit last fall (1874), the quality and flavor of which is *equal to the best Riesling of the Rhine!*

forgotten. But, in the absence of any satisfactory reason for these failures, it is quite natural that renewed attempts were and are continually made.* We ourselves, imported in the spring of 1867, from Austria, about 300 rooted vines, (Veltliner, Blue Baden, Tantowina, Riesling, Tokay, Uva Pana, &c.,) not with expectations of success, but with a view to discover by careful observation, the real cause of failure, and knowing the true cause, to be then perhaps able to obviate it. The vines grew splendidly, but during the summer of 1869, though bearing some beautiful fruit, their foliage began to exhibit a yellow, sickly appearance. In 1870 many were dying and we almost despaired of discovering the cause, when our State Entomologist, Prof. C. V. Riley, informed us that a discovery had just been made in France, by MM Planchon and Lichtenstein: that the serious grape disease which had attacked their noble vineyards, was caused by a root-louse, which bears a close resemblance to our American grape-leaf gall-louse, an insect long known here, but then more than usually abundant, actually covering all the Clinton foliage in 1870. In 1871 and since, Prof. Riley often visited our vineyards, as we gave him full permission and cheerful assistance to unearth both diseased and healthy vines, native and foreign, of every kind, in order to examine their roots and to study the question. By his observations and those of Prof. Planchon, made by both in this country as well as in France, and afterwards confirmed and verified by all prominent naturalists, the identity of the American insect with the one lately discovered in France, and of the two types, the gall and the root-lice, has been substantiated, and by this the true reason, at least the principal cause of the absolute failure of European vines in this country has been discovered ;† but no satisfactory remedy. While the mildew, (Peronospora and Oidium) may be successfully treated with sulphur, it seems, so far, impossible to destroy or to protect against this insect enemy; while the vigorous roots of our American vines enjoy a relative immunity from its injuries, the pest thrives on the tender roots of the European vines, which readily succumb.

The French Commission, in its report to the Viticultural Congress, held at Montpellier, Oct. 1874, came to the conclusion that: "In presence of the non-success obtained from all attempts made since 1868, with a view to preserve or cure our vines, and feeling that after six years of efforts in this direction, no process, except submersion, has been found effective, many persons are quite discouraged, and see in the American vines, whether justly so or not, the *only* plank of safety." How much more, then, must we look to species which we find indigenous here, and their descendants, for success in grape culture.

A knowledge of the distinctive permanent characters of our species, and a proper classification of our varieties, referable to them, is of far more importance than is generally supposed.* And while many grape growers may skip over the following pages as useless, we hope that *some* of them will thank us for embodying in this catalogue, the valuable treatise on this subject by the best living authority—Dr. G. Englemann. Twenty-five years ago Robert Buchanan wrote in his valuable little book on the culture of the grape: "The perfection of a definite arrangement of all our varieties must remain for future labors, but it is to be hoped an end so desirable, will not be lost sight of." In connection with the question of the relative susceptibility of our grape-vines to the attacks of Phylloxera, this end has become still more desirable, aye, of first importance.

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*Thos. Rush, a German, planted (in 1860) varieties of the Vinifera on Kelly's Island; they seemed to succeed the first three years remarkably well, then they died and were replaced by the Catawba vineyards, which his son still successfully cultivates.

As late as 1872, M. J Labiaux, at Ridgeway, North Carolina, undertook to plant vineyards with 70,000 cuttings (principally Aramons), imported from Southern France. In the same vicinity, Mr. Eug. Morel, a pupil of Dr. Jules Guyot (the best authority on French grape culture), and others, are also cultivating several thousands of European vines—with what success remains to be seen.

†See "Insects injurious to the grape-vine," at the close of this "Grape Manual."

*Even Mr. A. S. Fuller, in his excellent Treatise on the Grape Culture, written in 1866, said: "Practically it is of little consequence what view is taken of these unusual forms (of distinct species, or marked varieties of the species), as the cultivator is interested in them only as varieties, and it is of no particular moment to him whether we have one hundred or only one native spespecies." We are satisfied that he considers it of far more consequence now. Moreover, the *descriptions of varieties* become far more complete and intelligible by referring these to the species to which they respectively belong. Being acquainted with the distinct characteristic peculiarities of each species, it becomes superfluous to mention in a grape of the Æstivalis class that it is free from foxiness, or if of the Labrusca class, that its foliage is wooly beneath, &c.

The True Grape-vines of the United States.

BY DR. G. ENGELMANN.

The Grape-vines are among the most variable plants, not only through cultivation, by which numberless varieties have been produced, but even in their wild state, in which climate, soil, shade, humidity, and perhaps *natural hybridization*, have originated such a multiplicity and such an intermixture of forms, that it is most difficult to recognize the original types and to refer the different given forms to their proper alliances. Only by carefully studying a large number of forms from all parts of the country, in their peculiar mode of growth, and especially their fructification, or rather *their seeds*, are we able to arrive at any thing like a satisfactory disposition of these plants.

Before I proceed to the classification of our Grape-vines, I deem it necessary to make a few preliminary remarks:

All the true Grape-vines bear fertile flowers on one stock, and sterile flowers on another separate stock, and are, therefore, called *polygamous*, or, not quite correctly, *diœcious*. The sterile plants do bear male flowers with abortive pistils, so that while they never produce fruit themselves, they may assist in fertilizing the others; the fertile flowers, however are hermaphrodites, containing both organs and capable of ripening fruit without the assistance of the male plants.* Real female flowers, without any stamens, do not seem ever to have been observed. Both forms, the male and the hermaphrodite, or if preferred, those with sterile and those with complete flowers, are found mixed in the native localities of the wild plants, but only the fertile plants have been selected for cultivation, and thus it happens that to the cultivator only these are known, and as the Grape-vine of the Old World has been in cultivation for thousands of years, it has resulted that this hermaphrodite character of its flowers has been mistaken for a botanical peculiarity, by which it was to be distinguished, not only from our American Grape-vines, but also from the wild grapes of the Old World. But plants raised from the seeds of this, as well as of any other true Grape-vine, generally furnish as many sterile as fertile specimens, while those produced by layering or cuttings, of course only propagate the individual character of the mother-plant.

The peculiar disposition of the tendrils in the Grape-vines, first indicated by Prof. A. Braun, of Berlin, furnishes an important characteristic for the distinction of one of our most commonly cultivated species, *Vitis Labrusca*, its wild and its cultivated varieties, from all others. In this species—and it is the only true *Vitis* exhibiting it—the tendrils (or their equivalent, an inflorescence), are found opposite *each* leaf, and this arrangement I designate as *continuous tendrils*. All the other species, known to me, exhibit a regular alternation of two leaves, each having a tendril opposite it, with a third leaf without such a tendril, and this arrangement may be named *intermittent tendrils*. Like all vegetable characters, this is not an absolute one; to observe it well it is necessary to examine well-grown canes found in early summer, and neither sprouts of extraordinary vigor nor stunted autumnal branchlets. The few lowest leaves of a cane have no opposite tendrils, but after the second or third leaf the regularity in the arrangement of the tendrils, as above described, rarely fails to occur. In weak branches we sometimes find tendrils irregularly placed opposite leaves, or, sometimes, none at all.

It is a remarkable fact, connected with this law of vegetation, that most Grape-vines bear only two inflorescences (consequently two bunches of grapes) upon the same cane, while in the forms belonging to *Labrusca* there are often three, and sometimes, in vigorous shoots, four or five, or rarely, even six in succession, each opposite a leaf. Whenever, in rare cases, in other species, a third or fourth inflorescence occurs, there will always be found a barren leaf (without an opposite inflorescence) between the second and third ones.

Young seedlings of all the Grape-vines are glabrous or only very slightly hairy. The cob-webby or cottony down, so characteristic of some species, makes its appearance only in the older or in the adult plants; but in some of their

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*These fertile plants, however, are of two kinds; some are *perfect hermaphrodites*, with long and straight stamens around the pistil; the others bear smaller stamens, shorter than the pistil, which soon bend downward and curve under it; these may be called *imperfect hermaphrodites*, approaching females, and they do not seem to be as fruitful as the perfect hermaphrodites, unless otherwise fertilized.

It is proper here, to insist on the fact that nature has not produced the male plants without a definite object, and this object is, without any doubt, found in the more perfect fertilization of the hermaphrodite flowers, as it is a well established fact that such cross fertilization produces more abundant and healthier fruit. Vine growers might take a hint from these observations, and plant a few male stocks in their vineyards, say 1 to 40 or 50 of their fertile stocks, and might expect from such a course healthier fruit, which probably would resist rot and other diseases better than fruit grown in the ordinary way. I would expect such beneficial influence especially in all varieties that have short stamens, such as the Taylor. Male stocks can be easily obtained either in the woods or from seeds. It is of course understood that the males ought to belong to the same species (not necessarily to the same variety), as the fertile plants of the same vineyard. European vine growers may also profit by this suggestion.

varieties, and not rarely in the cultivated ones, it is mainly observed in the young growth of spring and is apt to disappear in the mature leaf; but even then such leaves are never shining as they are in the glabrous species, but have a dull or unpolished, or even wrinkled surface.

The form of the leaves is extremely variable, and descriptions must necessarily remain vague. Leaves of seedling plants are all entire, i. e. not lobed; young shoots from the base of old stems, as a rule, have deeply and variously lobed leaves, even where the mature plant shows no such disposition. Some species * or some forms of a few species † have all the leaves more or less lobed, while others exhibit on the mature plant only entire, or, I should rather say, *not lobed* leaves. Only the leaves of flower-bearing canes ought to be considered as the normal ones.

The surface ot the leaves is glossy and shining, and mostly bright green; or it is dull above and more or less glaucous below. The glossy leaves are perfectly glabrous, or they often bear, especially on the nerves of the lower side, a pubescence of short hair. The dull leaves are cottony or cobwebby, downy on both or only on the under side; and this down often extends to the young branches and to the peduncles, but as has been stated above, often disappears later in the season.

Not much of a distinctive character can be made out of the flowers. It is observed, however, that in some forms the stamens are not longer than the pistil, and very soon bend under it, while in other forms they are much longer than the pistil, and remain straight till they fall off. It is possible that those with short stamens are less fertile than the others.

The time of flowering is quite characteristic of our native species, and it seems that the cultivated varieties retain herein the qualities of their native ancestors. The different forms of *Riparia* and *Cordifolia* flower first of all; next comes *Labrusca* and its relatives, and the last flowering species is *Æstivalis*. If we are permitted to judge from a few isolated observations, *Vinifera* flowers later than Labrusca, and a little earlier than Æstivalis. *Riparia* begins to open its flowers, according to the season, from one to over two weeks earlier than the first blossoms of Æstivalis are seen in the same locality. In favorably situated vineyards in the vicinity of St. Louis, the first grape-vines (*Riparia*), begin to bloom between May 10th and 28th and the last (*Æstivalis*), end between June 1st and 15th; and we are not likely to have here any grape-vines in bloom before May 10th, nor after June 15th.*

One of the botanical characters of the Grape-vines is found in the *seeds*. The bunches may be larger or smaller, looser or more compact, branched (shouldered) or more simple, conditions which, to a great extent, depend on soil and exposure; the berries may be larger or smaller, of different color and consistency, and contain fewer or more seeds (never more than four), but the seeds, though to some extent variable, especially on account of their number and mutual pressure, where more than one is present, exhibit some reliable differences.† The big top of the seed is convex or rounded, or it is more or less deeply notched. The thin lower end of the seed, the beak, is short and abrupt, or it is more or less elongated. On the inner (ventral) side are two shallow longitudinal depressions. Between them is a ridge, slight where there are one or two seeds, or sharper where the seeds are in threes or fours; along this ridge the *raphe* (the attached funiculus or cord) runs from the *hilum*, at the beak, over the top of the seed, and ends on its back in an oval or circular well-marked spot, called by botanists *chalaza*. This raphe is on that ridge represented by a slender thread, which on the top and back of the seed is entirely indistinct, or scarcely perceptible, or it is more or less prominent, like a thread. In our American species these characters seem pretty reliable, but in the varieties of the old world grape-vine (*Vinifera*), several thousands of years removed from their native sources, the form of the seed has also undergone important modifications, and can no longer be considered such a safe guide as in our species.

The annexed cuts of 18 grape seeds illustrate the different characters which have been mentioned above. The figures are magnified four times, (4 diameters), accompanied by an outline of natural size, all represent the back of the dry seed.

Figs. 1 to 3. *Vitis Æstivalis* with the raphe and the more or less circular chalaza strongly developed; the seeds are from wild grapes gathered about St. Louis, the seeds of the cul-

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* *Vitis Riparia*.

†Forms of *Vitis Labrusca* and of *Vitis Æstivalis*.

* *V. Vulpina* blooms even later than Æstivalis, in the South; it does not grow here.

These remarks are thrown out, more to induce grape growers to devote some attention to such observations, than as definitely settling these points.

† A single seed is always thicker, plumper, more rounded; two seeds are flattened on the inner, rounded on the outer side; three or four seeds are more slender and angular; these different variations may sometimes be found in berries of the same bunch.

tivated forms are very similar; figs. 1 and 2 are from berries with 1 and 2 seeds, fig. 3 from a larger 4-seeded berry.

Figs. 4 to 7. *Vitis Riparia* from wild plants; figs. 4 and 5 from Goat Island on the Niagara Falls; fig. 4 a single broad seed; fig. 5 from a 3-seeded berry; fig. 6 from a 2-seeded berry from the shores of Lake Champlain, in Vermont; fig. 7, seed of the June grape from the banks of the Mississippi below St. Louis. The seeds are obtuse, or very slightly depressed on top, chalaza rather flat, elongated and gradually lost in a groove which encloses the scarcely prominent raphe. The seeds of the true *Vitis Cordifolia* are similar, but usually with a more prominent raphe, somewhat intermediate between *Æstivalis* and *Riparia*, or near *æstivalis*

Figs. 8 and 9. *Taylor-Bullit* and *Clinton*, both believed to be cultivated forms of *Riparia*, with seeds larger, but of the same shape.

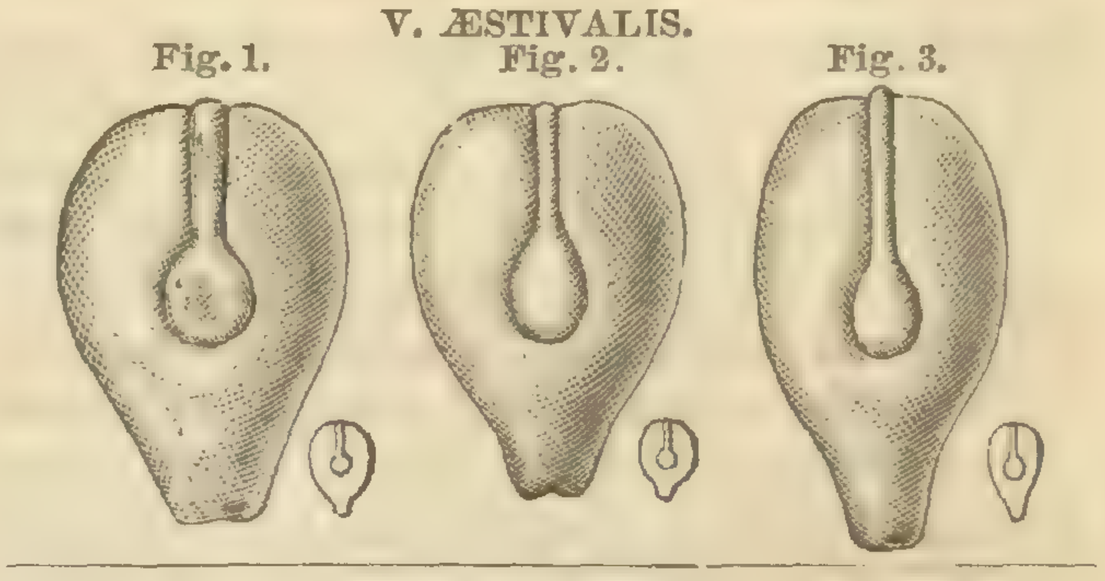
Fig. 10. *Delaware*, with broad, notched seeds, indistinct raphe and rather flat chalaza—appears intermediate between Riparia and Labrusca.

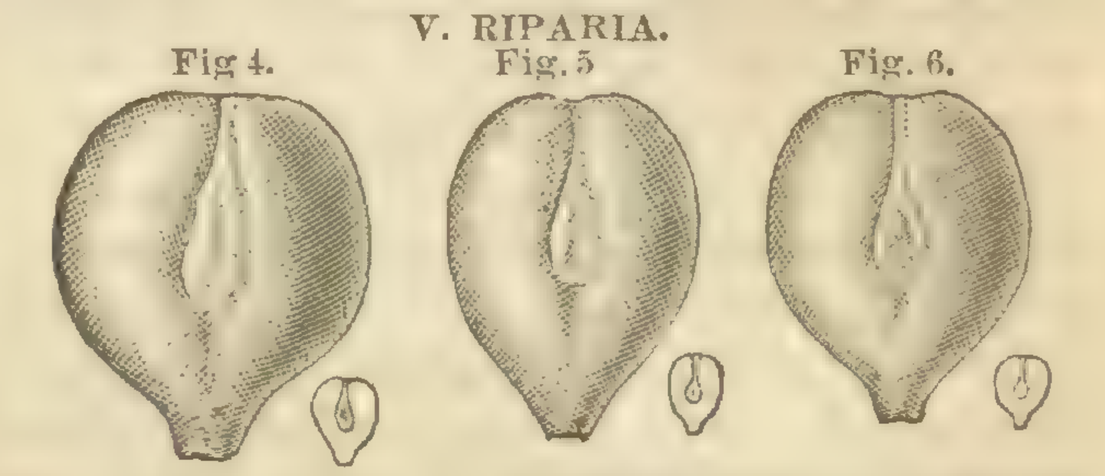
Figs. 11 and 12. *Vitis Labrusca.* Fig. 11 a native of the District of Columbia and fig. 12 of the mountains of East Tennessee. Seeds large, notched; chalaza more depressed in the first than in the second; no raphe is seen in the groove which extends from the chalaza to the notch.

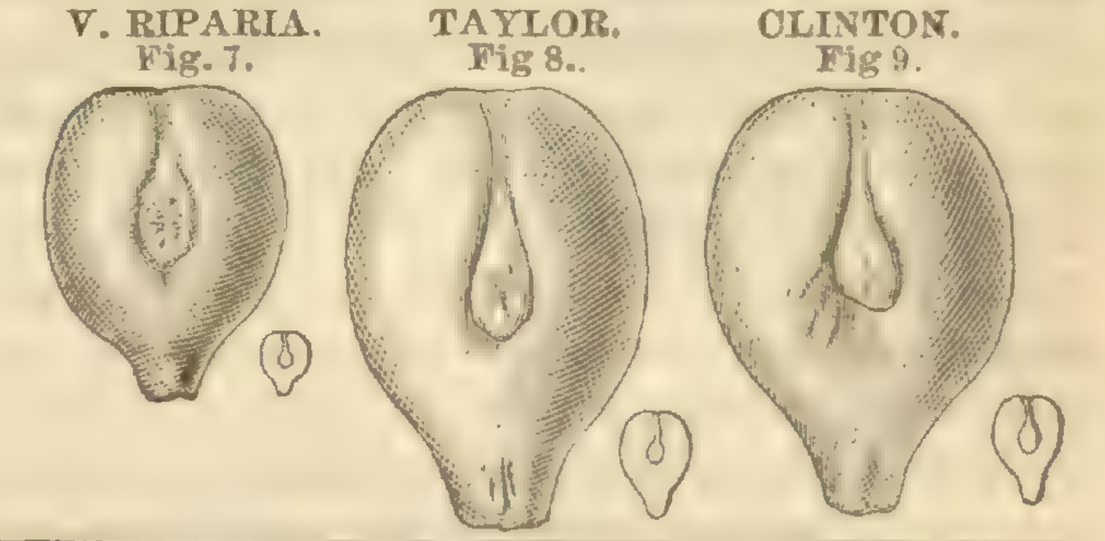
Fig. 13. *Vitis Candicans*, from Texas, similar to the last, seeds broader, with shorter beak, less distinctly notched, no raphe visible.

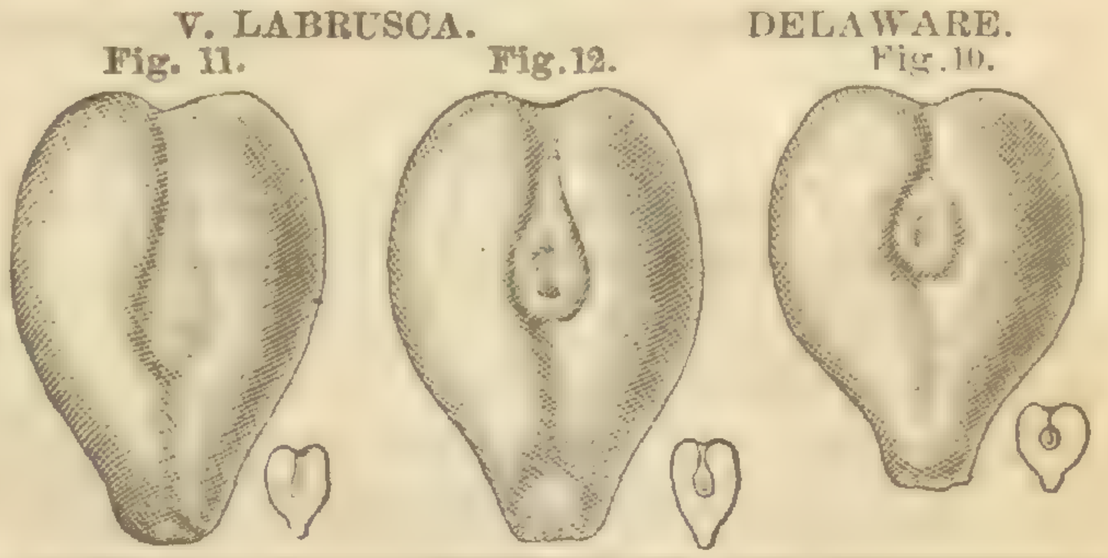
Fig. 14. *Vitis Vulpina*, from South Carolina, a very distinct seed, flatter, with straighter sides, short beak, wrinkled on both surfaces, notched on top, narrow chalaza, no visible raphe.

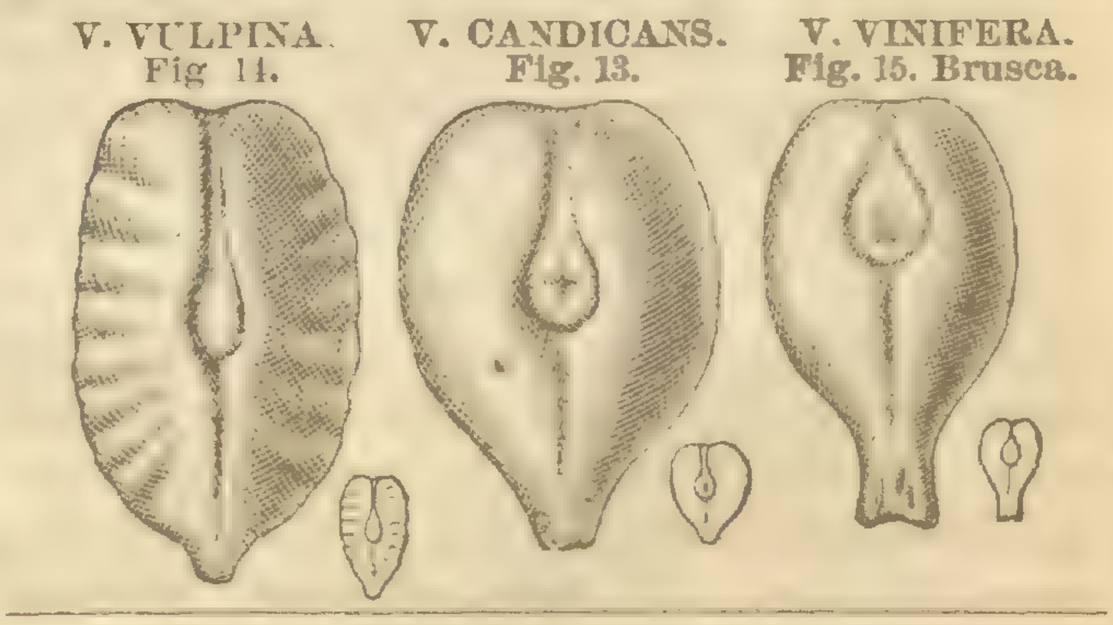
Figs. 15 to 18. *Vitis Vinifera*, from Europe, different forms, which are introduced here for comparison with the American species. Fig. 15, *Brusca*, the native species of Tuscany (Northern Italy); fig. 16, *Riesling*, cultivated on the banks of the Rhine; fig. 17, *Gutedel* (*Chasselas*), from the same region; fig. 18, *Black Hamburg*, from a grapery near London. All these seeds, different as they are among themselves, are easily distinguished from all American grape-seeds, by the narrower and usually longer beak (or lower part), and especially by the large, though not very prominent chalaza, which occupies the upper, and not the middle part of the seed. These four specimen seeds represent the principal forms, but not all European grape seeds agree entirely with them.











It is interesting to know that since the times of Linnæus and of Michaux, not a single real species has been added to those belonging to the territory of the old United States, east of the Mississippi river, though Rafinesque, LeConte and perhaps others, have attempted to distinguish and characterize a great many more; while Director Regel, of the St. Petersburg botanic garden, has lately attempted, rather unnaturally, to contract them and unite them with old world species—*Vitis Vinifera*, resulting, according to his views, from the hybridization of several of these species.*

The number of true Grape-vines (with petals cohering at the top and separating at the base, so that the corolla falls off without expanding; and with edible fruit,) in the present territory of the United States, considered good species, is limited to nine, which may be enumerated thus:

I. Grape-vines with loose shreddy bark, climbing by the aid of branched tendrils, or, (in No. 1,) without tendrils, and not climbing at all.

a Berries small, 3—6 or rarely 7 lines in diameter, (in No. 7 larger,) seeds more or less rounded on the top, with the raphe often more or less prominent on the top and back, or inconspicuous. All the species of this group have (on well grown shoots), intermittent tendrils.

1. VITIS RUPESTRIS, Scheele.
   Bush-grape or Sand-grape.
2. VITIS CORDIFOLIA, Michaux.
   Winter or Frost-grape.
3. VITIS RIPARIA, Michaux.
   Riverside grape.
4. VITIS ARIZONICA, Engelmann.
   Arizona-grape.
5. VITIS CALIFORNICA, Bentham.
   California-grape.
6. VITIS ÆSTIVALIS, Michaux.
   Summer-grape.
7. VITIS CANDICANS, Engelmann.
   Mustang-grape, of Texas.

b Berries large, 7—9 or even 10 lines in diameter; raphe scarcely visible on the more or less deeply notched top of the seed; tendrils continuous.

8. VITIS LABRUSCA, Linnæus.
   Northern Fox Grape.

II. Grape-vines with (on the younger branches), **firmly adhering bark, which only in the older stems scales off; aerial roots from inclined trunks in damp localities; tendrils intermittent, simple; berries very large,** (7–10 lines thick,) **very few in a bunch, easily detaching themselves at maturity; seeds with transverse wrinkles or shallow grooves on both sides.**

9. VITIS VULPINA, Linnæus.
   Southern Fox Grape, or Muscadine.

It will be seen that the first four species are more or less glabrous, the next four more or less woolly or cottony; the ninth again glabrous. The first six have smaller berries, the others larger ones. The practically useful American Grape-vines, are principally Nos. 3, 6, 8 and 9, distinguished in the above list by large capitals.

The following *descriptions of* these *species*, arranged in the order of their importance to our

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* The Grape-vine of the Old World, *Vitis Vinifera*, Linnæus, finds its place ~~in this section,~~ between *Vitis Riparia* and *Vitis Æstivalis*. Though many of its cultivated varieties bear berries as large, or even larger than those of any of our American Grape-vines, other cultivated forms, and especially the true wine-grapes, those from which the best wines are obtained, and also the wild or naturalized ones, have fruit not larger than that of the above named native species.

This plant, together with the Wheat, belongs to those earliest acquisitions of cultivation, the history of which reaches beyond the most ancient written records. Not only have the sepulchres of the mummies of ancient Egypt preserved us its fruit (large sized berries) and seed, but its seeds have even been discovered in the lacustrian habitations of northern Italy. It is a mooted question, where to look for the native country of this plant, and whether or not we owe the different varieties of our present *Vinifera* to one or to several countries, and to one or to several original wild species, which, by cultivation through uncounted ages, and by accidental and repeated hybridization, may have produced the numberless forms now known, which remind us so forcibly of the numerous forms of our Dog, which we also cannot trace, but which can scarcely be derived from a single (supposed) original wild species. Director Regel of St. Petersburg, ascribes them to the intermingling of a few species, well known in their wild state at this day; Prof. Braun, of Berlin, suggests that they are the offspring of distinct species yet found wild in many parts of Southern Europe and Asia, which thus he considers not the accidental offspring of the cultivated plants, as is generally believed, but the original parent stock. I may add, from my own investigations, that the Grape-vine which inhabits the native forests of the low banks of the Danube, "bottom-woods," as we would call them, from Vienna down into Hungary, well represents our *Vitis Cordifolia* and *Riparia*, with its stems 3, 6 and 9 inches thick, and climbing on the highest trees, its smooth and shining, scarcely lobed leaves and its small, black berries. On the other hand, the wild grape of the thickets of the hilly countries of Tuscany and Rome, with its lower growth, downy leaves, and larger and more palatable fruit, which 'don't make a bad wine,' as an Italian botanist expresses himself, reminds us, notwithstanding the smaller size of the leaves, of our *Vitis Æstivalis*. It was known to the ancients as *Labrusca*, a name improperly applied by science to the American species, and is called by the natives to this day *Brusca*. The Grape-vines of the countries south of the Caucasus mountains, the ancient Colchis, the reputed original home of these plants, greatly resemble the Italian plant just described.

The European Grape-vine is characterized by smoothish, and, when young, shining, more or less deeply, five or even seven lobed leaves; lobes pointed and sharply toothed; seeds mostly notched at the upper end; beak elongated; raphe indistinct; chalaza broad, high up the seed. In some varieties the leaves and branchlets are hairy and even downy when young; the seeds vary considerably in thickness and length, less so in the shape of the raphe.

grape culture, are taken from Dr. Engelmann's publication (in C. V. Riley's Sixth Entomological report), revised by himself for our Manual. The *Viticultural Remarks*, with list of varieties to each species, are derived from other sources (principally from Wm. Saunders' U. S. Agr. Report, 1869), and from our own observations.

VITIS ÆSTIVALIS, Michaux. Climbing over bushes and small trees by the aid of forked, intermittent tendrils; leaves large (4—5 or 6 inches wide), of firm texture, entire, or often more or less deeply and obtusely 3—5 lobed, with rounded sinus and with short and broad teeth; when young always very woolly or cottony, mostly bright red or rusty; at last smoothish but dull, and never shining like Riparia; berries usually larger than in this species, coated with a distinct bloom, and, when well grown, in compact bunches; *seeds* usually 2 or 3, rounded on top, with a very prominent raphe. (*Fig.* 1–3.)

This is the well-known *Summer Grape* common throughout the Middle and Southern States, usually found on uplands and in dry, open woods or thickets, maturing its fruit in September. It is the most variable of our grapevines, and hence has seduced superficial observers into the establishment of numerous nominal species. A form with large leaves which retain their rusty down at full maturity has often been mistaken for *Labrusca*, which does not grow in the Mississippi Valley. Another form, more bushy than climbing, with deeply lobed rusty-downy leaves and sweet fruit, is *Vitis Lincecumii* of the sandy soils of Louisiana and Texas, often called Post Oak Grape. *Vitis Monticola*, the Mountain Grape of Texas, is a form with small entire leaves (the down of which at last is gathered in little tufts) and large acidulous berries. When this species gets into shady woods it assumes a peculiar form, approaching *V. Cordifolia* through its smaller black berries, without bloom, with more acid taste, and in larger bunches. Another form with ashy-white, downy, scarcely lobed leaves, and fruit like the last mentioned, which grows in our bottoms, often climbing high trees, or growing over bushes on the banks of lakes, I have distinguished by the name of *Cinerea*. It is not always easy to distinguish such forms from the other species, and perhaps less so to unite them under the single species, *Æstivalis*, unless the essential characters above enumerated be closely attended to, and the numberless gradual transitions from one form to the other be watched.

VITICULTURAL REMARKS.

VITIS *ÆSTIVALIS*.—This species is pre-eminently the WINE grape of the Atlantic States, and of the Lower Mississippi Valley. Owing to the fact that none of the varieties except the *Elsingburgh* and *Eumelan* will ripen north of the parallel of 40°, unless it may be in some peculiarly favored situation,* they have not been extensively planted, and their superior qualities are but little known. The berries are destitute of pulp, and the juice contains a larger percentage of sugar than any other improved American species. The foliage is not so liable to disease as that of the fox grape, and rot in the berries is comparatively unknown. Some of the best wines made in this country are produced from varieties of this family, although the most promising kinds have not been properly tested as to their wine-producing qualities. I am convinced that neither the wine-producing capabilities of the country nor the highest excellence of the product can be decided, until vineyards of these varieties are established in the best locations of favorable climates.—*Wm. Saunders*.

The most genial home of this species is the country of the Ozark Hills, Missouri, S. Kansas, Arkansas and Indian Territory; probably also south-west Illinois and the mountain slopes in Virginia, North Carolina, and Tennessee. And these must be looked upon as the great producing regions of this continent, (east of the Rocky mountains,) for a certain class of *fine wines*. In *Western Texas* also, the varieties belonging to this class seem to 'succeed better than any other class of grapes.' —*G. Onderdonk, Victoria, Texas. Handbook of Fruits.*

The following varieties of this most valuable species (omitting synonyms, untried new and discarded varieties), are now cultivated.

ALVEY. (Perhaps a cross with Vinifera; see page 35.)

CUNNINGHAM.
CYNTHIANA,
DEVEREUX.
ELSINBURGH.
EUMELAN.
HERBEMONT.
HERMANN.
LENOIR.
LOUISIANA.
NORTON'S VIRGINIA.
NEOSHO.
OHIO (JACQUEZ).
PAULINE.
RULANDER.

(Several new varieties of this species, some chance seedlings selected in the forests of Arkansas, others raised from seeds of cultivated varieties, are now on trial; among the latter two seedlings of *Norton's* Virginia and one of *Hermann* bearing *white* fruit.)

The *quality* of these varieties is so excellent, that even the French taste seems quite satisfied. Only their *size* is unsatisfactory. "Dans ce groupe se trouvent les raisins dont le goût se rapproche le plus des nôtres, et

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* Their proper climate is south of the isotherm of 70° Fahrenheit, for June, July, August and September; they require a longer season to attain maturity. The more tender varieties may be properly placed between the isothermal lines of 70° and 75°. [Isothermal lines denote localities of equal mean temperature, and have been delineated upon maps from careful observation, indicating the various belts of climate, the limits where certain important plants thrive, by far more accurately than by zones and geographical degrees, which have long been in vogue, but which really have no place in nature.]

qui donnent des vins colorés, corsés, à bouquet souvent delicat, et en tout cas non-foxé."—*J. E. Planchon, Les Vignes americaines.*

Mr. Herman Jaeger, of Neosho, south-west Missouri, writes us: "In southwest Missouri, southern Illinois, Arkansas, western Texas, (also in Tennessee and Alabama,) the Labrusca, or Fox grapes, bring two healthy crops of fine grapes, and of the most vigorous varieties, with proper culture and favorable seasons, a few more, —then they rot to such an extent, that they are entirely worthless. The Æstivalis never rots and is the only truly reliable grape for these States. It was believed that no *large* summer grapes were existing—but this is a mistake; summer grapes (Æstivalis), nearly of the size of Concord are found growing wild in Arkansas, and I am confident that superior table grapes will be obtained from their seed. The wild large Æstivalis are not as juicy nor as aromatic as the small; but by crossing the one with the other, we may obtain *large* grapes for the south-west as juicy as Herbemont, and as healthy vigorous and productive as Norton's Va., as free from rot and mildew as no Labrusca ever will be with us."

The varieties of this group generally prefer a dry, poor soil, intermingled with lime and decomposed stones, with a southern and south-eastern exposure, they seem to endure the severest drouths without flagging. Although we have seen some of them, especially the *Norton* and *Cynthiana*, bear immense crops on the deep, rich, sandy loam of our river bottom, their fruit does not reach the same perfection as on the hills. The *wood* of the true Æstivalis is very solid, hard, with small pith, and firm outer bark; so that it is almost impossible to propagate this species from cuttings. The bark on the one year old wood is of a dark gray color, bluish around the eyes. The *roots* are wiry and tough with a smooth, hard liber, penetrating deep into the ground, perfectly defying the attacks of Phylloxera. Their resistive power has been fully tested, and established beyond a doubt in several vineyards of the Hérault, surrounded by infested, dying French vines. As a stock for grafting they are in every respect superior to Clinton—but we think they are too good and valuable to serve merely as a grafting stock.

VITIS LABRUSCA, Linnæus. Plant usually not large, stems with loose, shreddy bark, climbing over bushes or small trees, though occasionally reaching the tops of the highest trees. Tendrils continuous, branched. *Leaves* (4—6 inches wide,) large and thick, entire, or sometimes deeply lobed, very slightly dentate, coated when young with a thick, rusty or sometimes whitish wool or down, which in the wild plants remains on the lower side, but almost disappears in the mature leaf of some cultivated varieties; *berries* large, in middle-sized, or, in some cultivated varieties, rather large bunches, bearing two or three or sometimes four seeds. (Figs. 11 and 12.)

This plant, usually known as the *Fox grape*, or *Northern Fox grape*, is a native of the eastern slope of the continent from New England to South Carolina, where it prefers wet thickets; it extends into the Alleghany mountains, and here and there even down their western declivity, but is a stranger to the Mississippi Valley. By far the largest number of varieties of grapevines now cultivated in our country, are the offspring of this species; a few produced by nurserymen, but most of them picked up in the woods; they are easily recognized by the characters above given, and most readily by the peculiar arrangements of the tendrils as above described. Large and downy-leaved varieties of *V. Æstivalis* are, in the West and South-west, not rarely mistaken for *Labrusca*, but the two may always be distinguished by the characters indicated.

VITICULTURAL REMARKS.

"For *table* use, this species, in its improved varieties, will probably always occupy a prominent position in a large portion of the Eastern and Northern States as well as in the Northern sections of the Western States; and in those regions where the climate will not favor the maturity of the best varieties of this class, the inferior kinds will occupy their place.

As a wine grape the *V. Labrusca* has been over-estimated; the tough, musky pulp of even the best varieties requires a long and favorable season of growth to reduce the acid center so as to produce a proper ratio of the ingredients necessary for a passable quality of wine."

Fully endorsing the above quoted views of William Saunders, Superintendent of the Experimental Gardens at Washington, we do not wish to be understood as advocating the discontinuance of planting and using Labrusca grapes for wine-making; we are well aware that the Catawba and Concord furnish the bulk of our most popular wines. But for wines of finest quality we recommend the Æstivalis, where its varieties succeed, as far superior to the Labrusca. Moreover, we recognize in this species a Northern and a Southern form (same as in the Riparia and Æstivalis), with distinct characteristics.

The *Northern* Labrusca—a plant of great vigor, hardiness and productiveness; abundant, heavy, branching and fibrous *roots*, thick pith and firm liber; with a fruit of superior size, but also of a disagreeable roughness and foxiness in taste or flavor. The *Southern* Labrusca—a far more tender plant, very sensitive to casualties from unfavorable atmospheric changes of climate, with few and feeble *roots*, of only moderately firm texture; but also with a much more delicate fruit of an agreeable musky flavor. The first will not do well at the South, the second will be found subject to fungoid and other diseases, and will not well ripen at the North. Both are subject to rot, and do not continue to succeed well in the South-west, where both types of the Labr. seem not to feel at home.*

*G. Onderdonk writes us: "After all, *our* grapes in Texas must come from the Æstivalis family. *No Labrusca* has given us good, permanent satisfaction here." This same view is obtaining ground in Arkansas and south-west Missouri, after full trial and dearly bought experience.

The principal varieties of this species, thus classified, are:

[a] *Northern Group.*	[b] *Southern Group.*
BLACK HAWK.	ADIRONDAC.
CONCORD.	CASSADY.
COTTAGE.	CATAWBA.
DRACUT AMBER.	DIANA.
HARTFORD PROLIFIC.	IONA.
IVES.	ISABELLA.
LADY.	ISRAELLA.
MARTHA.	LYDIA.
NORTHERN MUSCADINE.	MAXATAWNY.
PERKINS.	MOTTLED.
RENTZ.	REBECCA.
TELEGRAPH.	TO-KALON.
VENANGO.	UNION VILLAGE.

This subdivision of Labrusca into a northern and southern form is a new idea of our own, and may be a mistake. It is here presented for the first time, not as an established fact, already accepted or endorsed by any botanical authority, but as a hypothesis worthy of consideration and further research. In some few varieties (Creveling, North Carolina, &c.) we find it as yet difficult to determine to which group they should be assigned; but this difficulty exists also, in some, with regard to the species.

The varieties enumerated under A, which we consider the Northern group of Labrusca, may be relied upon as sufficiently resistive to Phylloxera; they seem to us the most preferable grafting stock; those under B, the Southern group of Labrusca, though exhibiting a larger degree of resistance in this country than Vinifera, suffer from the insect. (Planchon and Riley have observed that the roots of Labrusca have a sweetish taste, without having the astringent or acid character belonging to the roots of other species, especially of Rotundifolia.)

VITIS CORDIFOLIA, Michaux. Tall (or more rarely low), climbing high by the aid of intermitting branched tendrils, trunks often 6—9 inches in diameter, with loose shreddy bark. Leaves middle-sized or small (2½—3 or 4 inches in diameter), *round-heart-shaped*, mostly entire or very slightly tri-lobed on the edges, with broad shallow teeth, usually smooth and shining, more on the upper than on the lower side; the young ones sometimes, and very rarely the old ones, with short hair on the ribs below; panicles compound, large and loose; berries among the smallest, in large, mostly loose bunches, black, without a bloom and without tough pulp; maturing late in the fall, usually with a single short and thick seed, marked by a more or less prominent raphe.

This grows more especially in fertile soil, and is a common plant in river and creek bottoms. It is well known by the name of Winter Grape, Frost Grape, or Chicken Grape, and it is, together with the next, the earliest flowering species; the flowers, principally the sterile, (male,) are especially fragrant. It is found from New England to Texas, and westward to the western limits of the wooded part of the Mississippi valley. In this valley, at least, the fruit has a strong and even fetidly aromatic taste, which unfits it for making into preserves or for pressing wine. No cultivated varieties of this species are known.

VITIS RIPARIA, Michaux. Similar to the last, but usually a smaller plant, with larger (3–5 inches in diameter) and more or less incisely 3 lobed, glabrous, shining (or rarely when young, slightly hairy) leaves, the lobes long and pointed, the teeth also more pointed than in *Cordifolia;* panicles rather small and compact; *berries* usually larger than in the last, mostly with a bloom, in smaller and often more compact bunches, without pulp, commonly 1 or 2-seeded; seeds obtuse, or sometimes very slightly depressed, with the raphe often almost obliterated.

This species prefers thickets or rocky soil on river banks, and extends as far south as the last, and much farther north and west, being the only grape vine in Lower Canada, where it is found even 60 miles north of Quebec, and the only one on the eastern slope of the Rocky Mountains. The northern form, in Canada, northern New York to Michigan and Nebraska, has fewer and larger berries in a bunch, and is easily distinguished from *V. Cordifolia*. The south-western form, however, a taller plant, with smaller black berries, approaches more closely to this last species, and often seems to run so close to it that in some editions of his manual, Prof. Gray has united both under the name of *V. Cordifolia*, Michx. The fruit ripens earlier than that of *Cordifolia*, and is much pleasanter. (In St. Louis a variety found on the rocky river-banks is brought to market in July.)

VITICULTURAL REMARKS.

Both *Cordifolia* and *Riparia* are often considered types of one species, (Gray, Durand, Planchon,) and grape growers usually designate the cultivated varieties of this species as "*Cordifolia*;" Dr. Engelmann himself stated "that both species are so closely allied that it is a matter of individual judgment whether to keep them separate or to unite them;" we prefer therefore to adhere to that designation. The CLINTON, its most prominent variety, has certainly in the foliage, more of the true *Cordifolia* than of the *Riparia*, but the fruit, though maturing late in the fall, assimilates it more to the latter.

This section represents the most healthy grapes of the Northern States, yet they are equally healthy and even more productive at the South. A distinct form of this

species is found growing along the Alleghany range, from southern New York to Alabama, to which the TAYLOR and Oporto belong. These varieties exhibit more or less deformed stamens; but some individuals of this group possess excellent qualities, which, when properly developed, and their defects remedied, will make the best wine grapes in the country.—*Fuller.*

In the *ELVIRA*, this prediction seems fulfilled.

The foliage is rarely attacked by mildew, but the leaves, possibly owing to their smoothness, are occasionally injured by insect punctures. The Phylloxera prefers the foliage of this class of vines to all others—so that, in some seasons, it is covered with leaf-galls made by this formidable insect. The fruit is not subject to rot, and is noted for keeping well after being gathered from the plant. That of the northern form is late in maturing, and seems to reach its highest condition by remaining on the vine until the thermometer indicates proximity to the freezing point, when, even in northern localities, it proves to be a fruit of fair quality either for table or wine. Of course its quality is greatly improved by the length and geniality of the season of growth; for example, those who are familiar with the fruit only as a production of Massachusetts would not recognize its flavor and vinous character as ripened in southern Maryland or Virginia. The greatest objection to it as a wine grape is that of having too much acid. The fruit is not so deficient in sugar as is generally supposed, having enough of this important ingredient for a good wine. Nor has it any foxy or musky taste whatever, the judgment of our friends in France to the contrary, notwithstanding. The peculiar flavor in some varieties may displease them; tastes differ—we, ourselves do not admire the Clinton-goût, but it has certainly no resemblance to what we call "foxiness," as the characteristic of Labrusca. The flavor of *Taylor* and its seedlings seems to us unexceptionable. The *Marion* and other varieties of this class may also be preferable to Clinton in this respect. Analysis shows that they have a sufficiency of sugar, and it seems probable that the wines only require age to develop their qualities.

It is known that wines from the Clinton variety, when kept in a suitable cellar from four to six years, assume a fine character. There is abundant evidence to favor the belief, that if as much time and care had been devoted to the improvement of this species as has been given to the Fox family, we should now be in possession of a good northern red-wine grape.

The mode of management and culture has also a decided influence upon the productiveness of this species. The shoots grow with much vigor during early summer, frequently forming canes fourteen to twenty feet in length before the end of the season, on young plants in good soil. On these canes the best developed buds are some distance from the base, or point of growth on the stem; consequently, if cut closely back at the fall or winter pruning, the best buds for fruit bearing are removed, and a luxuriant growth of wood, with a minimum crop of fruit, will be the result. The varieties of this group should be planted on rather *poor soil*, deeply and well cultivated, as they are naturally rampant growers and when planted in rich soils are almost uncontrolable.

The wood of the cultivated varieties is soft, containing a thick medulla; they are growing therefore readily from cuttings. The *roots* are wiry and tough, with a a thin, hard liber, growing rapidly. Hence they possess great powers of resistance to the Phylloxera, which is usually found in small numbers on their roots, even while their foliage is densely covered with its galls. The roots have so much vitality that new rootlets push out from the swellings more rapidly than the insect can destroy them.

The varieties of this species, especially *Clinton*, are therefore largely used as stock for grafting, in the Phylloxera afflicted vineyards of France. We think them somewhat objectionable for this purpose, as they seem not to unite as readily with the graft, and are more subject to sprout from imperceptible buds, close to the roots, than varieties of other species.

VITIS VULPINA, Linnæus. LOW, or often climbing very high, with small, (2 or at most 3 inches wide) rounded, heart-shaped, firm and glossy dark-green leaves, smooth, or rarely slightly hairy on the under side, with coarse and large, or broad and bluntish teeth.

The Southern species, known under the name of *Southern Fox-grape*, *Bullace* or *Bullet-grape*, or *Muscadine*, is found along water-courses, and in damp woods of the Southern States, not further north than Maryland, Kentucky and Arkansas, though it may possibly straggle into south-east Missouri. Some of its cultivated varieties, especially the white *Scuppernong*, are highly esteemed in the South.

VITICULTURAL REMARKS.

Southern grape growers generally designate this species as Vitis *Rotundifolia*, Michaux. It is strictly confined to the Southern States, and in foliage and wood is very unlike any other grape, either native or foreign, distinguishing itself by its small, roundish, shining leaves, never lobed, and green on both sides; by its bright smooth bark, never scaly or shaggy; by its fruit which forms no bunches, but grows in large, thick skinned and pulpy berries, only about 2–4–6 in number on a stem; by its tendrils which are never forked, like those of other grape vines. The varieties of this type cannot be grown from cuttings. Pruning does not benefit them; on the contrary, they must be left growing, free, without any trimming, except cutting off smoothly the shoots and suckers from the ground to the lath-work or scaffold, which you may erect to support them. Without care or labor, save some good cultivation of the soil, they produce annually large and sure crops, being entirely free from rot and mildew and, it seems also, from the attacks of insects. The Vitis Rotundifolia enjoys so far, perfect immunity from Phylloxera, (some galls have been found on their *leaves*, but no trace of the insect on their roots, which are of an astringent, acrid taste.) This immunity caused them to be exported into France, but their fruit is so deficient in grape sugar, (although it tastes sweet, containing scarce *any* acid,) and it is so rich in musky flavor, that it cannot satisfy the refined French taste; and as a grafting stock, the hardness of the wood

and different construction of the bark makes the Rotundifolia unfit for this purpose. P. J. Berckmans of Augusta, Georgia, who makes the propagation of this species a specialty, enumerates seven varieties. SCUPPERNONG, FLOWERS, THOMAS, MISH, TENDER PULP, PEDEE and RICHMOND, (there exists also an Isabella-seedling under the name of Richmond.)

VITIS CANDICANS, Engelmann. (V. Mustangensis, Buckley.) The Mustang grape of Texas; a tall climber, with rather large, rounded, almost toothless leaves, white, cottony on the under side, bearing large berries, which, like those of the wild *Labrusca*, show different colors, greenish, claret and bluish-black; and which, in its native country, are made into wine. In young shoots and sprouts the leaves are usually deeply and elegantly many-lobed.

VITICULTURAL REMARKS.

This species grows wild in great abundance along the creeks and rivers of Texas, chiefly western and middle Texas. It resembles the Labrusca by its downy leaves and its bark; it can also be grown from cuttings. We know as yet of but three varieties of the Mustang found in the woods; a black, a red and a *white Mustang*.

VITIS RUPESTRIS, Scheele. A small, bushy plant, often without any tendrils, rarely somewhat climbing; leaves small (2–3 inches wide), and often folded, mostly broader than long, heart-shaped or truncate at base, scarcely ever slightly lobed, with broad, coarse teeth and usually an abruptly elongated point, glabrous, and of a glaucous or light green color; berries middle sized, in very small bunches; seeds mostly 3–4, round, with an extremely short beak, obtuse, with a small chalaza; raphe very slender or invisible.

This very peculiar grape-vine is found only west of the Mississippi, from the Missouri river to Texas and westward probably to New Mexico. In our State, where it is called *Sand grape*, and in Arkansas, it grows on the gravelly banks and overflowed bars of mountain streams; in Texas also on rocky plains, whence the Latin name; it is there sometimes called *Sugar grape*. Its luscious fruit ripens with us in August.

It is nowhere yet in cultivation, but may in future prove of value.

VITIS CALIFORNICA, Bentham. The only wild grape of California, has rounded, downy leaves and small berries, and is not made use of as far as known. The seeds are obtuse, with a short beak, elongated chalaza, and very slender raphe.

VITIS ARIZONICA, Engelm. Similar to the last, but tomentose only when young, later glabrous, with middle-sized berries, reported to be of a luscious taste.

HYBRIDS.

Besides the varieties referred either to the one or the other of these species, we cultivate now many grapes which originated by *cross-breeding;* either through the agencies of wind or insects, or through the efforts and skill of man.

The former, or natural hybridization, is no doubt of frequent occurrence, but as neither the act can well be observed, traced or recognized, nor the character of the young seedlings thus produced be ascertained, these are generally passed unnoticed in the vineyard, or destroyed. Without discussing the subject any further, we state it as our opinion and belief, that some of the chance seedlings we cultivate are the product of such natural cross-fertilization; thus we believe we recognize in

the ALVEY, a Hybrid between *Æst.* and *Vinifera*,
the CREVELING, " " *Labr.* and *Riparia*,
the DELAWARE, " " *Labr.* and *Vinifera*, or *Labr.* and *Riparia*,
the ELVIRA, " " *Riparia* and *Labr.*

and so in a few others (as will be mentioned in their description), possessing certain distinct characteristics of *two distinct* species.

The second class, Hybrids produced by artificial cross fertilization, though of but recent date, are now very numerous. When the supposition that seedlings from the foreign species, raised in our own soil and climate would be more hardy, proved fallacious, efforts were made to secure Hybrids between the native grapes and Vitis Vinifera; hoping thus to combine the superior excellence of the foreign with the health and vigor of our native plants.

"It is desirable that in artificial cross-breeding not only the species, but the varieties used should be carefully noted, and also that the parents, the *maternal* (the variety which has been artificially fertilized), and the *paternal* ancestor (the plant from which the pollen was employed), should always be named."—*Dr. Engelmann.*

The Hybrids thus produced are:

1. Hybrids between *Labr. and Vinifera:*—

ADELAIDE.
AGAWAM.
ALLEN'S HYBRID.
AMINIA (R. 39).
BARRY.
BL. DEFIANCE.
BLACK EAGLE.
CHALLENGE.
CLOVER STR. BLACK
CLOVER STR. RED.
CONCORD CHASSELAS.
CONCORD MUSCAT.
CONQUEROR
DIANA HAMBURG.
ESSEX.
GÆRTNER.
GOETHE.
HERBERT.
IMPERIAL.
IRWING.
LINDLEY.
MASSASOIT.
MERRIMAC.
REQUA.
ROGERS' HYBRIDS.*
SALEM.
SENASQUA.
TRIUMPH.
WILDER.
And many more, less known.

2. Hybrids between *Cordifolia* and *Vinifera:*—

ADVANCE.
AUTUCHON.
BRANDT.
CANADA.
CORNUCOPIA.
NEWARK.
OTHELLO.
QUASSAIC.
SECRETARY.

* Not named.

3. Hybrids between *Delaware* and *Vinifera:*—

CROTON, ITHAKA, WYLIE'S DELAWARE HYBRIDS.

By crossing the *Delaware* with *Diana* were produced the ONONDAGA and WALTER, perhaps also RARITAN; by a cross of Delaware and Cordifolia Mr. Rickett produced the PUTNAM, and finally, some crosses between Hybrids were produced.

So far most Hybrids produced were between *Labr.* and *Vinifera;* as the former have a tendency to leaf mildew, to fruit rot, and roots subject to the attacks of Phylloxera; the production of a healthy, resisting form, in a Hybrid between these and the here still more unhealthy Vinifera, is highly improbable, especially when some tender, glass-house grown variety is used for that purpose. Only by the selection of the most healthy and hardy varieties of a native and foreign species, or, perhaps still better, by an intermixture of the best and most vigorous native species, may really valuable results be obtained.

Most of the Hybrids which we now cultivate are of too recent introduction to be thoroughly tested; yet it is already apparent that their adaptability to successful culture is in proportion to their affinity to the native parent, especially in roots and foliage. And the requirements of Hybrid grapes, as to climate, soil and aspect, will be found quite similar to the requirements of one or the other of their progenitors.

LOCATION.

The only *general* rules we can give, to guide us in the selection of a proper, desirable location for vineyards, are:

1. A good wine-growing region is one where the season of growth is of sufficient length to ripen to perfection our best wine grapes, exempt from late spring frosts, heavy summer dews, and early frosts in autumn. Do not attempt, therefore, to cultivate the grape in low, damp valleys, along creeks; low situations, where water can settle and stagnate about the roots will not answer; wherever we find the ague an habitual guest with the inhabitants, we need not look for healthy grape-vines; but on the hillsides, gentle slopes, along large rivers and lakes, on the bluffs overhanging the banks of our large streams, where the fogs arising from the water give sufficient humidity to the atmosphere, even in the hottest summer days, to refresh the leaf during the night and morning hours, there is the location of the grape.

2. A good soil for the vineyard should be a dry, calcareous loam, sufficiently deep (say three feet) loose and friable, draining itself readily. New soils, both granitic and limestone, made up by nature of decomposed stone and leaf mould, are to be preferred to those that have long been in cultivation. If you have such a location and soil, seek no further, ask no chemist to analyze its ingredients, but go at once to

PREPARING THE SOIL.

The old system of *trenching* is no more practiced, except upon very hard, stony soil, and upon steep hillsides, being too costly and of very little, if any, advantage. The plow has taken the place of the spade, and has much lessened the expense. While we would urge a thorough work in the preparation of the soil before planting the vine, and warn against planting in ditches, or worse yet in square holes, we believe that by careful grubbing (in timber lands) leaving no stumps, which would only be a continual eyesore and hindrance to proper cultivation, and then using a large breaking plow, followed by the subsoil plow, the soil will be stirred as deep (say twenty inches) as is really necessary to insure a good and healthy growth of vines. This will require two to three yoke of oxen to each plow, according to the condition of the soil. For old ground a common two-horse plow, with a span of strong horses or cattle, followed in the same furrow by a subsoil stirrer, will be sufficient to stir the soil deeply and thoroughly, and will leave it as mellow, and in its natural position as desirable. This may be done during any time of the year when the ground is open and not too wet. Most soils would be benefited by underdraining; the manner of doing it is the same as for other farm crops, except that for vines the drains should be placed deeper; it is less important on our hill sides, and too costly to be practiced to a great extent here; wet spots, however, must be drained at least by gutters, and to prevent the ground from washing, small ditches should be made, leading into a main ditch. Steep hill sides, if used at all, should be terraced.

PLANTING.

The soil being thus thoroughly prepared and in good friable condition, you are ready for planting. The proper season for doing this is in the fall, after the 1st of November, or in the spring, before the 1st of May. Most vineyards are planted in spring, and in northern, very cold localities, this may be preferable. *We* prefer fall planting; the ground will generally be in better condition, as we have better weather in the fall, and more time to spare. The ground can settle among the roots in winter; the roots will have healed and calloused over, new rootlets will issue early in spring before the condition of the ground would have permitted planting, and the young plants commencing to grow as soon as the frost is out of the ground, will start with full vigor in spring. To prevent the

roots from being thrown to the surface by alternate freezing and thawing, a mound of earth hoed up around the plants, or a ridge thrown up with a plow, so as to elevate the ground somewhat in the rows, will be found to afford all the protection necessary. By no means delay planting till *late* in spring (after May first here), and if your ground is not ready in time, you had much better cultivate it with corn or hoed crops of some kind, and postpone planting until next fall. Planting in rows, six feet apart, is now the usual method; it gives sufficient space for a horse and man to pass through with plow or cultivator; the distance in the rows varies somewhat with the growth of the different varieties and the richness of the soil. Most of our vigorous, strong growers, the Concord, Ives, Hartford, Clinton, Taylor, Norton, Herbemont, will need eight to ten feet in the rows; Scuppernongs are planted 20 to 30 feet apart; while the Delaware, Catawba, Creveling, Iona, may have sufficient room when planted six feet apart. The dwarfing treatment practiced with European varieties, especially by German vintners, will not do for American vines, which must have ample room to spread and a free circulation of air. The number of vines required to set an acre (containing 43,560 square feet), will be:

DISTANCE, FEET.	METRES.	NUMBER.
5 ft. by 5 ft.	1 m 54 by 1 m 54	1,742
5 ft. by 6 ft.	1 m 54 by 1 m 85	1,452
6 ft. by 6 ft.	1 m 85 by 1 m 85	1,210
6 ft. by 7 ft.	1 m 85 by 2 m 15	1,037
6 ft. by 8 ft.	1 m 85 by 2 m 46	907
6 ft. by 9 ft.	1 m 85 by 2 m 75	807
6 ft. by 10 ft.	1 m 85 by 3 m	725
7 ft. by 7 ft.	2 m 15 by 2 m 15	889
7 ft. by 8 ft.	2 m 15 by 2 m 46	777
7 ft. by 9 ft.	2 m 15 by 2 m 75	690
7 ft. by 10 ft.	2 m 15 by 3 m	622
8 ft. by 8 ft.	2 m 46 by 2 m 46	680
8 ft. by 9 ft.	2 m 46 by 2 m 75	605
8 ft. by 10 ft.	2 m 46 by 3 m	544
9 ft. by 9 ft.	2 m 75 by 2 m 75	537
9 ft. by 10 ft.	2 m 75 by 3 m	484
10 ft. by 10 ft.	3 m by 3 m	435

1 acre = 41 *ares* French measure, or one *Hectare* nearly equal to two and a half acres.

Having determined the distance at which you desire to plant the vines, mark off the rows, running them parallel, and with the most level lines of your slope or hillside, so that you may easily plow between the rows and that the ground may not wash. (On an eastern slope the rows will therefore run in a direction from north to south, which most vine dressers prefer.) Be careful, on sloping ground, to leave spaces for surface drains, the steeper the hillsides the more frequent must these surface drains be. Then divide the rows into the desired distances, by the aid of a stretched line, and put small stakes where each plant is to stand. Now, if the ground is sufficiently dry so as to pulverize well, make the holes to receive the vines, as shown in fig. 19. The depth of these holes must necessarily vary somewhat with the nature of the soil. On very steep hillsides,

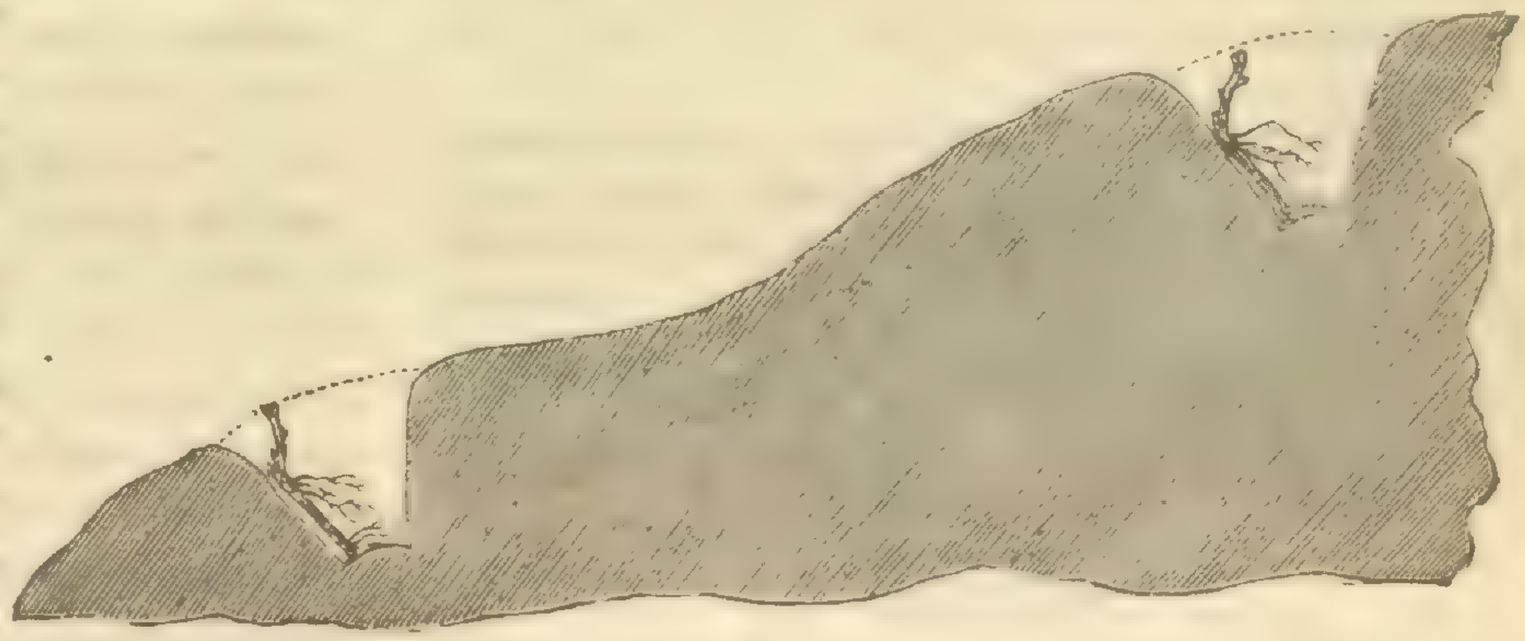


Fig. 19.

and especially on southern slopes, with naturally warm, dry soil, you must plant deeper than on gentle slopes with deep, rich soil, or on bottom land and rich prairies. Eight inches will be deep enough on the latter; on the former we should plant from twelve to fourteen inches deep.

Having made the holes, and it is best not to make too many at a time, as the ground will dry out too quickly, you can go to planting.

We do not intend to discuss here the various modes of multiplication or propagation of grape vines from cuttings, layers or single eyes (buds), still less the production of new varieties from seed and Hybridizing, as this would far exceed the scope of this brief Manual, nor do we desire to say whether you should plant cuttings or rooted plants, and whether plants grown from cuttings, from single eyes or layers, are preferable. Propagators and nurserymen are not considered disinterested, impartial judges on this question. But we may reasonably suppose that those who read this catalogue are either our customers or desire to purchase rooted vines from us, and want to get *the best plants*. Vines raised from layers were in former years held to be superior, and are still preferred by many, but unprejudiced and observing cultivators have found that they only *look* stronger and finer, but are *not as good* as plants properly

grown from cuttings or single eyes, of mature, healthy wood. The disposition to multiply the new varieties of grapes rapidly, has led to the production of vast numbers of vines from summer layers, or, still worse, from green cuttings. The plants so produced usually prove only a disappointment to the planter, and greatly injure the reputation of new varieties.

Our German and French vine-dressers generally practiced growing vines from *long* cuttings, but short (two or three eye) cuttings will undoubtedly make stronger and better ripened roots. Others again have obtained the best results from single eye plants, and consequently prefer them. We have tried all, and find that it makes very little difference how the vine has been raised, provided it has strong, firm, healthy, well-ripened roots. (We never found any grown from green or unhealthy wood or from *long* cuttings that had them.) As a general rule, a *well grown vine* is in its best condition for planting when *one* year old. Fuller and some other good authorities prefer two-year old, transplanted vines; vines older than two years should not be planted, and so-called extra large layers "for immediate bearing," are a humbug.

There is, however, one method of propagating the grape, namely, by GRAFTS, which belongs more properly to the sphere of the cultivator, the vineyardist, than the nurseryman or propagator; and which, owing to the ravages of the Phylloxera, is becoming of unprecedented importance, and presents itself under almost entirely new aspects.

GRAFTING.

The researches of our scientists, prominent among them our friend Prof. Riley, enable us now to form pretty accurate estimates of the resisting powers of the roots of different varieties, and we find that the premature decay and short-lived existence of the vines of most of our finer varieties of the Labrusca class, (its Southern group) as well as nearly all the Hybrids having blood of the vinefera class, must be mainly attributed to the attacks of the insect.

How far we possess a remedy to this, by GRAFTING such kinds on those of acknowledged greater resistance, is a question which is as yet not fully determined and still open to further test and experiments, but which deserves the greatest attention. Another object for which grafting is very desirable is the early testing of new varieties. By grafting on a vigorous bearing vine we will generally obtain bearing wood, and sometimes even fruit, the first season. We are also enabled by grafting to turn old vigorous vines of perhaps some worthless variety to good account, as with a little trouble and care, and the loss of only one year, we can change them into some choice and valuable variety. But before we enter into details of the "modus operandi" of grafting, we will first speak of the conditions generally considered essential to the successful performance of the operation.

First. THE STOCK. Though from our own experience we can not side with those who claim that the stock and scion should in all cases belong to the same class to insure perfect success, it is still worth while to give this point a little consideration. The general experience seems to prove that the stocks of the Cordifolia class, of which we may take the Clinton as the type, do not unite readily with varieties of the Æstivalis or Labrusca, though we know of numerous instances where they did unite perfectly and formed fine and healthy vines. But aside from this there is a great objection to the Clinton class on account of its tendency to throw up suckers from the old stock, even for years after the graft has become established, which requires constant care and watchfulness that these suckers, which generally grow with remarkable vigor, do not usurp the place we have assigned to the grafted scion. This objection falls away almost entirely with the other classes after the first season, and once the graft is growing vigorously.

A point which is of far more importance is the perfect health and vigor of the stock. We should never select a sickly or diseased vine, nor one subject to the attacks of the Phylloxera as a stock to graft upon. Even if the graft should live it will thrive but poorly, unless indeed it belongs to some very vigorous variety, and is grafted deep enough below the surface, where it may form its own roots, which will then support it entirely, and it will soon dissolve its union with the unhealthy stock. But even then it will require years to overcome the effects of the uncongenial partnership. If the object is to guard a variety subject to the Phylloxera against the ravages of this insect, we should select for the stock a vine of a strong and vigorous variety, which possesses recognized powers of resistance to the insect. The graft should then be inserted as near the surface of the ground as possible, and where practicable even above it. Some have asserted that the stock and scion should be of varieties as near alike as possible in vigor of growth, but with

this we cannot agree. We should invariably prefer to graft a weak grower on a strong one.

Second. THE SCION. This should be from a healthy and short jointed cane from the last summer's growth, and of moderate size, (a little stouter than an ordinary lead pencil is the thickness which we prefer.) It should be cut from the vine before very hard freezing weather, and kept in a cool cellar, either in damp moss, sand, or sawdust, or else buried in the ground. In case the grafting is to be performed *late* in Spring, the scion may be kept dormant in an ice-house.

Third. WHEN TO GRAFT. The best time, as far as days and months are concerned, varies of course with the locality and latitude; but as a rule we would lay down that the vine cannot be grafted with good success, either while the sap is running so freely and liquid as to cause the vine when cut to bleed, as it is termed, nor yet (except by the process of inarching, of which hereafter) from the time when the young shoots in the Spring, or rather early Summer, begin to turn hard and fibrous, which generally commences about the time of the bloom, until after the fall of the leaf. This reduces the time for successful grafting to two periods, the first one lying between the fall of the leaf and the rising of active circulation in Spring, and the second one commencing after this exceeding strong flow of sap has abated and lasting until the full development of the first young growth.

In the more Southern States grafting may be successfully and practically performed during the first period. In fact, Dr. A. P. Wylie of Chester, S. C., that veteran and enthusiastic grape grower, upon whose opinion we lay the highest weight, informs us that the Fall or early Winter is in that latitude the *proper* time for grafting. Further north, and even in the latitude of St. Louis, Fall grafting is not quite as certain, for even when protected by a mulch of straw or leaves the graft is in danger of being thrown out by the heaving of the ground caused by the frost. In this latitude however we often have fine days in February and early in March, when the ground is open and before the active flow of sap has commenced, which should be improved for the operation. Still further North where the ground opens late, and Spring comes in all at once, these days are generally so few that they can seldom be made use of. For these latitudes the best opportunity lies in the second period or during the time the sap has ceased its active flow and exudes from the wound in a gummy state. Some have even claimed good success in mid-summer with scions of the same season's growth, but we must confess ourselves as extremely dubious in regard to the success of this.

We now come to the operation itself. The method most generally applied is cleft grafting. After clearing away the soil around the collar of the stock to be operated upon, to the depth of 3 or 4 inches, select a place below the surface with a smooth exterior around the collar, cut the vine off horizontally just above this place with a fine toothed saw; then split the stock with a common grafting chisel or other sharp instrument, so that the cleft will run down about 1½ or 2 inches. Insert the small end of the grafting chisel or a narrow wedge in the centre of the cleft to keep it open, and then with a very sharp knife, cut your scion, which may be 3 to 4 inches long, and with one or two eyes, to a long wedge shape at the lower end, to fit the cleft, leaving the outer side a trifle thicker than the inner one, and insert it in the cleft, so that the inner bark of both stock and scion make a close fit on each other as much as possible; then withdraw the wedge in the centre, and the scion will be held firmly in its place by the pressure of the stock. It is not necessary to wrap or tie such grafts, except when the stock is a very light and small one, in which case some bass string or other material should be tightly wound around to bind stock and graft together. If the stock is a large one two scions may be inserted, one on each side. This mode of grafting answers for stocks varying from one-half to three inches in diameter. To complete the operation, replace the soil, filling it up, so that the upper bud on the scion is level with the surface. A shade placed so as to protect it from the noon-day sun, or a slight mulch, is very desirable.

Another mode of cleft grafting, which though a little more tedious, is perhaps also that much more certain, is to *saw* a slit in the stock about one and a half inches deep with a thick bladed or wide set saw, instead of using the chisel. The cleft thus made must be spread open sufficient only to receive the scion, which must be cut to fit nicely in the slit with its upper portion resting, with a square shoulder each side, on the stock. In this instance we prefer a graft with two buds, the lower one of which should be the point where to cut the shoulders. In other respects the same rules apply to this mode as those given before. The greatest advantage is that we can always make a clean straight cleft, even when the stock is gnarly or twisted.

(We may as well remark here that the Wagner grafting machine, which is highly recommended by many who have tried it, works upon the same principle.) As the slit cut by the saw is always of a uniform thickness, the scions may be prepared beforehand in the house during a rainy day or in the evening, and kept in damp moss until wanted.

There are besides various other methods of grafting the grape below the surface of the soil, but as the one we have described is that which is most generally adopted, and we have reason to think, also, the most successful one, we refrain from describing the others.

It frequently happens that the buds of the grafts swell rapidly within a few days after the operation, and then after having given great promise for a week or two, they turn brown and apparently die off. Do not let this discourage you too quickly, and above all make no rash examinations of the cause of this seeming failure, by pulling out the scion or otherwise loosening it. A graft will often remain in this state for a period of five or six weeks, and then start up all at once with a vigor that will push young wood to the length of twenty or more feet the same season. Keep the young growth well tied up and carefully remove all suckers from the parent stock as soon as they appear.

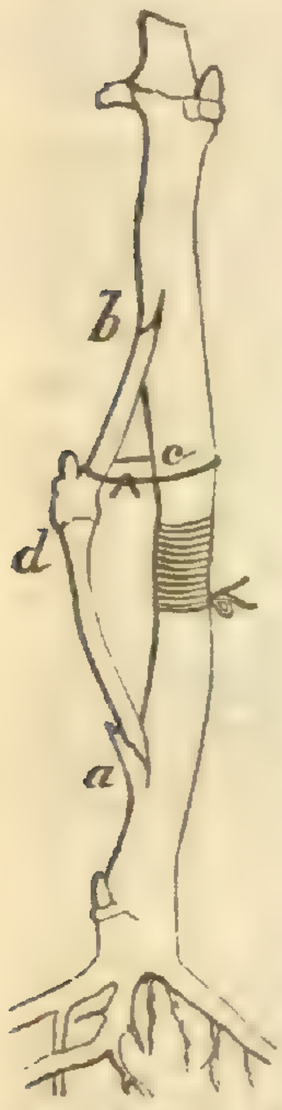
However, if our object is to graft a variety subject to the Phylloxera on a stock whose roots are healthy and possess the power of resisting the insect, we must place the scion so that the grafted variety can not form its own roots, which would soon become the prey and breeding ground for the insect, and by their disease would contaminate the whole vine. We must in this case aim to place the graft *above* the surface of the soil. The cleft and other ordinary modes of grafting are, unfortunately, seldom successful, unless worked *below* the surface. Having this object in view we take recourse to grafting by approach or inarching.

For this method it is desirable that two plants, one each of the variety which is to form the stock, and one of the scion, are planted close together, say about one foot apart. In June (the first year, if the plants make a sufficiently strong growth, if not, the second year,) or as soon as the young shoots become sufficiently hard and woody to bear the knife, a shoot is taken from both the stock and the scion vine, and at a convenient place, where they may be brought in contact, a shaving is taken out from each of these, on the side next to the other, for a length of 2 to 3 inches. This must be done with a smooth cut of a sharp knife, a little deeper than the inner bark, so as to obtain on each a flat surface. They are then fitted snugly together, so that the inner bark joins as much as possible, and wrapped securely with some old calico torn in strips, or soft bass strings. Besides this, it is well to place one tie a little below, and one above the grafted point, and also to tie the united canes to a stake or trellis to insure against all chances of loosening by the swaying of the wind. The rapid swelling of the young growth at this period of the year makes it desirable that the grafts be looked over after a few weeks, replacing such ties which may have burst, and loosening others which may bind so as to cut into the wood. A union will generally be made in the course of two or three weeks, which will be further consolidated in the course of 6 to 8 weeks, when the bandages may be removed and the grafted portion left exposed to the sun, to thoroughly harden and ripen it. The shoots themselves are to be left to grow undisturbed for the rest of the season. In the fall, if a good union has taken place, the cane forming the scion is cut close *below* its union with the stock cane, which in its turn is cut close *above* the connection. Supposing the stock to have been a Concord and the scion a Delaware, we now have a vine of the latter entirely on the strong, vigorous root of the former. Of course constant vigilance must be exercised to prevent suckers from starting out of the stock. It is well to protect the grafted joint the first few winters by a slight covering of straw or soil to prevent the frost from splitting it apart.

Mr. Cambre, a practical and successful grape grower near Nauvoo, Ills., and to whom we owe the main points of these directions, has practiced this system on a large scale and with the most flattering results. He has applied it extensively to the Delaware, using wild seedlings from the woods as the stock, and thus succeeds in raising fine and regular crops of this excellent grape, even in seasons when other vines of this variety on their own roots in the neighboring vineyards are a total failure. It would be highly interesting if others in different sections of the country would also experiment with this system.

Another mode of grafting above ground, practiced with success by a Mr. Cornelius, (copied from "The Gardeners' Monthly" by W. C. Strong in his valuable work, "The Cultivation of the Grape") is not merely interesting in itself, but also illustrative of many other modifications in grafting:

"After the first four or five leaves are formed, and the sap is flowing, you choose the place on the vine where you intend to graft. At that point wrap tightly a twine several times around the vine. This will, in a measure, prevent the return sap.



Below the ligature make a sloping cut down, as shown at *a;* also, a similar reversed one above the ligature, as at *b*, about one inch in length. In selecting a scion prefer one that has naturally a bend. Cut it so that it shall be wedge-shape at both ends, and a little longer than the distance between the cuts in the vine at *a* and *b*. Insert the scion, taking care to have the barks in direct contact, securing it with a string, *c*, bound round both scion and vine sufficiently tight to force the scion-ends into their places. If the work is done well, no tie will be required at *a* and *b*, but the joints should be covered with grafting wax. In a short time, the bud at *d* will commence its growth, after which you can by degrees remove all the growing shoots not belonging to the scion, and in course of the summer you may cut off the wood above *b*, and in the Fall remove all above *a* on the stock, and above *c* on the scion.

This, as well as all other methods of grafting above ground, require much careful watching, and a judicious use of grafting wax, as its entering into the slit is positively injurious.

Quite recently Mr. Henry Bouschet of Montpellier, France, has proposed the following system of grafted cuttings, "boutture greffée," to replant with them their Phylloxera destroyed vineyards. It consists in uniting a portion of the American grape-cutting, (making resisting roots,) which is to serve as stock, with a portion of the European grape-cutting (of which the fruit is desired) as graft, as shown in annexed figure, and the united cutting, snugly tied together with some slight shreds, is then planted like a simple long cutting, thus doing both the planting and grafting at the same time. Of course the graft can be previously prepared in the room, at the fireside. Mr. Bouschet has shown at the Exposition of the Viticultural Congress at Montpellier, (Oct. 1874,) samples of such grafts, which had made a successful union and growth, and gigantic experiments are now made with this system in France.

We propose to experiment more extensively ourselves in the matter of grafting with the view to combat the inroads of the Phylloxera, and the results of our experiments shall be duly made public. We are confident that many of our choicest table grapes, and perhaps even European grapes, could, if worked in such a way, be successfully grown in many regions where they are now a total failure.

Of wine grapes, on the other hand, we have now such good and valuable varieties, like Cynthiana, Cunningham, Elvira, Herbemont, Hermann, Louisiana, Neosho, etc., all of which are free from the destructive effects of the Phylloxera, not to speak of a number of new and highly promising Æstivalis seedlings, which as a class are good resistants to the insect, that to be successful in growing a good wine grape, we, here, need have no recourse to the interesting, yet nevertheless, laborious process of grafting the grape vine.

But now let us return to the *modus operandi* of planting. Take your vines, from the place where they were heeled-in,* wrapped in a wet cloth, or in a pail with water, to the holes; when planting, let one person shorten the *roots*, with a sharp knife, then spread them out evenly to all sides, and let another fill in with well pulverized earth. The earth should he worked in among the roots with the finger, and lightly pressed to them with the foot. Lay the vine in slanting, and let its top come out at the stake previously set. Then, with your knife, cut back the top to a bud just above, or even with the surface of the ground. Do not leave more than two buds on any one of the young vines

*On receiving your vines from the nursery, they should be taken out of the box, without delay, and *heeled-in*, which is done as follows: In a dry and well protected situation, a trench is made in the soil 12 to 15 inches deep, and wide enough to receive the roots of the plants, and of any required length the soil being thrown out upon one side. The plants are then set thickly together in the trench, with the tops in a sloping direction and against the bank of soil thrown out of the trench; another trench is made parallel to the first, and the soil taken from it is thrown into the first, covering the roots carefully, filling in all of the interstices between them. Press down the soil, and smooth off the surface, so that water shall not lodge thereon. When one trench is finished, set the plants in the next, and proceed as before. When all this is completed, dig a shallow trench around the whole, so as to carry off the water and keep the situation dry.

which you are planting, however strong the tops, or however stout and wiry the roots may be. *One* cane is sufficient to grow, and merely to be prepared for possible accident, both buds are allowed to start. The weaker of the two shoots may afterwards be removed or pinched back.

When planted in the fall, raise a small mound around your vine, so that the water will drain off, and throw a handful of straw or any other mulch on the top of the mound, to protect it; but do not cover the vine with manure, either decomposed or fresh, under any circumstances.

It is a well authenticated fact that, under the action of nitrogenous agents, the grape grows more luxuriant, its leaves are larger, its product increases in quantity. But the products of vineyards so manured have an acknowledged defect—they impart to the wine a flavor which recalls the kind of manure applied. Moreover, nitrogenous substances exclusively used hasten the decay of vineyards and the exhaustion of the soil.

We use no manures in our vineyards, except the ashes of the stumps and brush, which we burn on the spot in clearing, and the decomposed leaves of the forest, which we have to turn under in plowing our grounds. Other soils may require manures, and ours may, in later years. But even those authorities who favor manures in *preparing* certain grounds, or long *after* planting, do not allow any decomposing organic matter to come in contact with the newly planted vine.*

During the first summer, little else can be done than to keep the ground mellow, loose about the plants and free from weeds; stirring the ground, especially in dry weather, is the best stimulant, far better than liquid manure, and *mulching* (spreading over the ground a layer of tan-bark, sawdust, straw, salt, hay, or the like, to maintain a more uniform state of temperature and moisture for the roots) is far better than watering. Do not tie your young vines up, do not pinch off the laterals; by allowing them to lie on the ground, during the *first* season, more vigorous stems will be obtained. A fair growth is about four feet the first summer. In the fall, after the foliage is all off, cut back to *two or three buds*. Cover the short cane left with a few inches earth before the ground freezes.

During the following winter, the TRELLIS should be built. The plan adopted by most of our experienced grape growers, as possessing some advantages over other plans, especially if grapes are grown in large quantities, is as follows: Posts of some durable timber (red cedar is best) are split 3 inches thick and about 7 feet long, so as to be 5 feet in height after being set; these posts are set in holes two feet deep, 16 to 18 feet apart in the rows (so that either 2 vines 8 feet apart, or 3 vines 6 feet apart, are between two stakes), *three* wires are then stretched horizontally along the posts, being fastened to each post with a staple ∩, which is driven in so firmly that the wire is prevented from slipping through. The two end posts should be larger than the others and *braced* (Fig. 20), so that the contraction of the wire (in cold weather) will not loosen them. The first wire is placed about 18 inches from the ground and the others 18 inches apart; this brings the upper wire about 4 feet 6 inches from the ground. The size of wire used is No. 10 annealed iron; but No. 12 wire is strong enough. At the present prices of wire the cost per acre will be from $40 to $60, according to distance of rows and number of wires used.

Fig. 20.—(Four wires, 15 inches apart.)

No 12 is the size most commonly used.

The Ludlow Saylor Wire Company, St. Louis, furnish us the following table, which may serve in calculating the cost:

* The experiments made in France during the years 1872, 1873 and 1874, with different methods of treating vines diseased by Phylloxera, led to the conclusion that manures especially those rich in potash and nitrogenous substances, benefit the affected vines. Squares thus treated, which were benefited in 1872 and 1873, have, in 1874, in some cases almost returned to their original vigor, but the Phylloxera has not disappeared. And the ministerial commission, reporting on these experiments believed itself justified in asserting that manures, rich in potash and nitrogen, mixed with alkaline or earthy sulphates, refuse of salt-works, *soot*, wood ashes, ammonia, or fat lime, have increased the productiveness of the vines and allowed the fruit to ripen. Prof. *M. Roesler* of Klosterneuburg, Austria, believes in fighting the insect with manure and phosphates, ammonia and potash. This treatment succeeds in porous soils, and to obtain this porosity the learned Œnologue made use of dynamite, raising the ground thus from a great depth, without injuring the vines.

Fig. 21.

Size of Wire.	Cost per lb.	Weight of 100 yards.	No. lbs. per mile.	No. yards per bdl. 63 lbs.	Length of 100 lbs. in yds.	Break with direct strain of lbs.	No. lbs. per acre.	Cost per acre, 3 strands—rows 8 feet apart.
9	6¼	18.36	323	342	609	1560	986	$ 64 15
10	8	14.97	264	420	747	1280	807	64 50
11	8	11.95	211	529	939	1000	645	51 60
12	8½	9.24	163	700	1244	800	499	42 35
13	9½	7.05	124	893	1519	568	377	36 00
14	9½	5.51	97	1142	2031	456	296	27 25

In place of the wire, slats or laths may serve the same purpose (as seen in fig. 21), but they are not durable, and the posts must then be put in much closer. Another mode of making wire trellis (the Fuller plan) is with horizontal bars and perpendicular wires, as shown in a following illustration (fig. 22). Posts of good, hard, durable wood, 3 inches in diameter and 6½ to

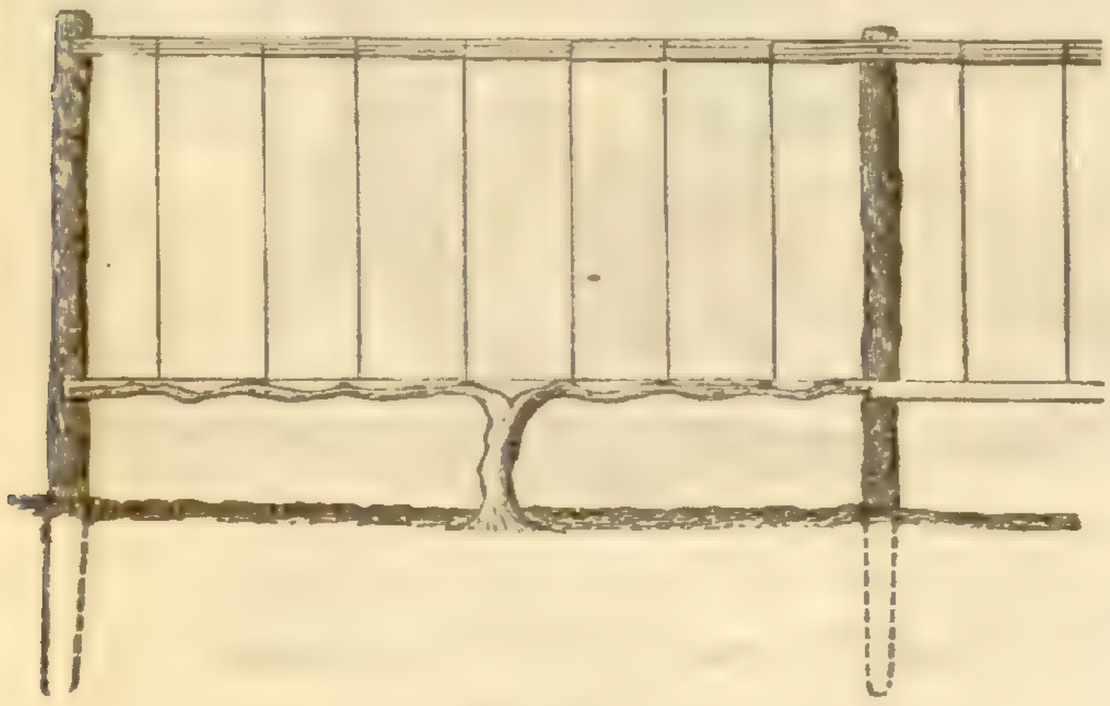


Fig. 22.

7 feet long, are placed between the vines, at equal distance from each vine, and in a line with them, two feet deep in the ground. When the posts are set, nail on strips about 2½ inches wide and 1 inch thick, one strip or bar being placed one foot from the ground, and the other at the top of the post. Then take No. 16 galvanized iron wire and put it on perpendicularly, twisting it around the lower and upper bar, at a distance of about 12 inches apart. Galvanized iron is preferable, and as a pound of No. 16 wire gives one hundred and two feet, the additional expense is but very small. This trellis will probably cost less than with horizontal wires, and is preferred by some. Practical experience, however, speaks in favor of horizontal wires, and a method with only two horizontal wires, the lower about 3 feet high and the upper about 5½ feet high, is gaining the good opinion of vineyardists, East and West. A good many grape growers train their vines to *stakes*, believing it to be cheaper, and the decline in the price of grapes and wine induces many to adopt the least costly plan; one, two and three stakes will be recommended by some, all of which will prove a slovenly—very inconvenient method. And yet, quite recently, a method of training our vines to but *one* stake each, pruning the vine to two branches, which are wound spirally, in opposite directions, around the stake, and *nailed* fast to its top, has been not only claimed as a new invention and as an improvement in grape culture, but has actually been patented! (J. B. Tillinghast, modes of training and securing Grave-vines, No. 155,995. Patented Oct. 13, 1874.)

Some people believe even that we could dispense with both trellis and stakes entirely, and urge the adoption of the "Souche" or "Buck Pruning" plan used in parts of France and Switzerland, but quite impracticable for our strong growing species.

If you have covered your young vines last fall, remove the earth from over them at the approach of spring; then *cultivate the whole ground*; plowing *between the rows* from four to six inches deep, and carefully hoeing around the vines with a pronged hoe; the two-prong German hoe or *Karst*, has been generally used in vineyards, but since we got *Hexamer's prong-hoe* we prefer this excellent tool. The ground should thus be broken up, inverted and kept in a mellow condition *continually; but do not work the ground when wet!*

During *the second summer*, a cane or shoot is produced from each of the two or three buds which you left on the young vine last fall. Of

Fig. 23.

these young shoots, if there are three, leave only the two strongest, tying them neatly to the trellis, and let them grow unchecked to the uppermost wire.

With the strong-growing varieties, especially where we intend to grow the fruit on laterals or spurs, the two main canes are pinched off when they reach the second horizontal wire, whereby the laterals are forced into stronger growth, each forming a medium-sized cane, which is shortened in the fall from four to six buds. One of the two main canes may be layered in June, covering it with mellow soil, about an inch deep, leaving the ends of the laterals out of the ground. These will generally make good plants in the fall for further plantations; with varieties which do not grow easily from cuttings, this method is particularly desirable. Fig. 23 shows the vines tied and pruned, accordingly, at the end of the second season (the cross lines through the canes showing where they are cut off or pruned).

Another good mode of training, recommended by Fuller, is to bend down in fall, at the end of the second season, the two main canes of the vines (the laterals of which have been pinched back to concentrate the growth into these main canes) in opposite directions, laying and tying them against the lower wire or bar of the trellis, as shown in figure 22, and shortening them to four feet each. Then let five or six of the buds on the upper side of the arms be grown into upright canes. All buds and shoots not wanted for upright canes, should be rubbed or broken off. This latter method is not well adapted for varieties which require covering in winter. Where the canes are started lower, near the ground, and cut loose from the wire, they can be easily covered with earth.

At the *commencement of the third season* (uncover and) tie the canes to the trellis, as shown before. For tying, any soft string or stout woolen yarn, the shreds of old gunnies, may be used; some obtain their tying material from basswood-bark, soaked for two weeks or longer in running water. Mr. Husmann recommends to plant the Golden Willow or any other willow (Purpurea Vinivalis), and to use its small twigs for tying purposes. Tie tightly, and as young canes grow, keep them tied, but, in all cases, take care against tying too tightly, as the free flow of sap may be obstructed.

The ground is now plowed and hoed again, as described before. From each of the buds left at the last pruning (as shown in the preceding figures), canes can be grown during the third year, and each of these canes will probably bear two or three bunches of fruit. There is danger of their being injured by over-bearing, on which account the bunches should be thinned out by taking away all imperfect bunches and feeble shoots. In order to secure future fruitfulness of the vine, and to keep it at the same time in our convenient control, we should allow no more wood to grow than we need for next seasons' bearing, and for this purpose we resort to *Spring pruning*, generally, though improperly, called:

SUMMER PRUNING.

The time to perform the first summer pruning is when the young shoots are about six inches long, and when you can see plainly all the small bunches—the embryo fruit. We commence at the lower two spurs, having two buds each, and both started. One of them we intend for a bearing cane next summer; therefore, allow it to grow *unchecked* for the present, tying it, if long enough, to the lowest wire. The other, which we intend for a spur again next fall, we pinch with the thumb and finger to just beyond

Fig. 24.

Fig. 25.

the last bunch or button, taking out the leader between the last bunch and the next leaf, as shown in fig. 24, the cross line indicating where the leader is to be pinched off. We now come

to the next spur, on the opposite side, where we also leave one cane to grow unchecked, and pinch off the other.

We now go over all the shoots coming from the arms or laterals tied to the trellis, and also pinch them beyond the last bunch. Should any of the buds have pushed out two shoots, we rub off the weakest; we also take off all barren or weak shoots. If any of them are not sufficiently developed we pass them over, and go over the vines again, in a few days after the first pinching.

The bearing branches having all been pinched back, we can leave our vines alone until after the bloom, only tying up the young canes from the spurs, should it become necessary. But do not tie them over the bearing canes, but lead them to the empty space on both sides of the vine, as our object must be to give the fruit all the air and light we can.

By the time the grapes have bloomed, the laterals will have pushed from the axils of the leaves on the bearing shoots. Now go over these again, and pinch each lateral back to one leaf, as shown in fig. 25. In a short time, the laterals on the fruit bearing branches which have been pinched will throw out suckers again. These are stopped again, leaving one leaf of the young growth. Leave the laterals on the canes intended for next years' fruiting to grow unchecked, tying them neatly with bass or paw-paw bark, or with rye straw to the wires.

If you prefer training your vines on the horizontal arm system (fig. 22) the mode of summer pruning will be in the main the same. Pinch off the end of each upright shoot *as soon* as it has made two leaves beyond the last bunch of fruit; the shoots after being stopped will soon start, and after growing a few inches should be stopped again, as we wish to *keep* them within the limits of the trellis, and the laterals should be stopped beyond its first leaf. Thus we try to keep the vine equally balanced in fruit, foliage and wood. It will be perceived that fall pruning, or shortening-in the ripened wood of the vine, and summer pruning, shortening-in and thinning out the young growth, have one and the same object in view, namely, to keep the vine within proper bounds, and concentrate all its energies for a two-fold object, namely, the production of and ripening of the most perfect fruit, and the production of strong, healthy wood for the coming season's crop. Both operations are, in fact, only different parts of one and the same system, of which summer pruning is the preparatory, and fall pruning the finishing part; but while the vine will bear, without apparent injury, any reasonable amount of pruning during its dormant state, in fall or winter, any severe cutting during summer is an unmitigated evil. G. W. Campbell, the well-known horticulturist, says: "All the summer pruning I would recommend, would be the early rubbing out of superfluous shoots, upon their first appearance; leaving only what is required for next years' bearing wood. This, with the pinching or stopping the ends of such shoots or canes as were disposed to be too rampant in growth, would be all I would ever consider necessary. Some of the most successful grape growers within my knowledge, carefully prune their vines in fall or early spring, and then leave them entirely without summer pruning." The importance of this matter is so great that we subjoin—

HUSMANN'S METHOD OF SUMMER PRUNING THE VINE.

[Extract from his excellent articles in the "*Grape Culturist*" on this most important operation.]

Without proper and judicious summer pruning, it is impossible to prune judiciously in the fall. If you have allowed six to eight canes to grow in summer where you need but two or three, none of them will be fit to bear a full crop, nor be properly developed. We prune longer in fall than the majority of our vintners, which gives a double advantage; should the frost of winter have injured or killed any of the first buds, we still have enough left; and should this not be the case, we still have our choice to rub off all imperfect shoots; to reduce the number of bunches at the first pinching, and thus retain only strong canes for the next years' fruiting, and have only large, well developed bunches.

But to secure these advantages we have certain rules, which we follow strictly. We are glad to see that the attention of the grape growers of the country is thoroughly aroused to the importance of this subject, and that the old practice of cutting and slashing the young growth in July and August is generally discountenanced. It has murdered more promising vineyards than any other practice. But people are apt to run into extremes, and many are now advocating the "let-alone" doctrine. We think both are wrong, and that the true course to steer is in the middle.

1. Perform the operation EARLY. Do it as soon as the shoots are six inches long. At this time you can oversee your vine much easier. Every young shoot is soft and pliable. You do

not rob the vine of a quantity of foliage it cannot spare (as the leaves are the lungs of the plant and the elevators of the sap). You can do three times the work that you can perform a week later, when the shoots have become hardened, and intertwined by their tendrils. Remember that the *knife* should have nothing to do with summer pruning. Your thumb and finger should perform all the work, and they can do it easily if it is done early.

2. Perform it *thoroughly and systematically*. Select the shoots you intend for bearing wood for next year. These are left unchecked; but do not leave more than you really need. Remember that each part of the vine should be thoroughly ventilated, and if you crowd it too much, none of the canes will ripen their wood as thoroughly nor be as vigorous as when each has room, air and light. Having selected these, commence at the bottom of the vine, rubbing off all superfluous shoots, and all which appear weak and imperfect. Then go over each arm or part of the vine, pinching every fruit bearing branch above the last bunch of grapes, or, if this should look weak or imperfect, remove it and pinch back to the first perfectly developed bunch. Should the bud have pushed out two or three shoots, it will generally be advisable to leave only the strongest, and remove the balance. Do not think that you can do part of it a little later, but be unsparing in taking away *all* you intend to take this time. Destroy all the caterpillars, and all the insects you find feeding on the vines, the steel-blue beetle, who will eat into the buds. But protect the lady-bug, mantis, and all the friends of the vine.

We come now to the second stage of summer pruning. After the first pinching, the dormant buds in the axils of the leaves, on fruit-bearing shoots, will each push out a lateral shoot, opposite the young bunches. Our second operation consists in pinching each of these laterals back to *one* leaf *as soon* as we can get hold of the shoot above the first leaf, so that we get a young vigorous leaf additional, opposite to each bunch of grapes. These serve as elevators of the sap, and also as an excellent protection and shade to the fruit. Remember, our aim is not to rob the plant of its foliage, but to make *two* leaves grow where there was but *one* before, and at a place where they are of more benefit to the fruit. By our method, our rows of vines have the appearance of leafy walls, each bunch of the fruit properly shaded, and yet each part of the vine is properly ventilated. We come now to another of those accidental discoveries, which has proved of great use to us in the management of the Concord, Herbemont, Taylor, etc. In the summer of 1862, when a piece of Concord, planted 1861, was growing rapidly, a severe hail storm cut up the young shoots, completely defoliating them, and breaking the tender and succulent shoots at a height of about two feet. The vines were growing rapidly, and the dormant buds in the axils of the leaves immediately pushed out laterals, which made very fair sized canes. In the following fall, when we commenced to prune, we found from three to five of these strong laterals on each cane, and accordingly shortened them in to from three to five and six buds each. On these laterals we raised as fine a crop of grapes as we ever saw, certainly much finer than we had ever before raised on the strong canes; and we have since learned to imitate hail storms by pinching the leaders of young shoots when they have grown, say two feet, forcing out the laterals, and growing our fruit on the latter, thus meeting with another illustration of the old proverb, "It is an ill wind that blows nobody any good."

After the second pinching of the fruit-bearing branches, as described above, the laterals will generally start once more, and we pinch the young growth again to one leaf, thus giving each lateral two well developed leaves. The whole course should be completed about the middle of June here, and whatever grows afterwards should be left. In closing, let us glance at the *objects* we have in view:

1. To keep the vines within proper bounds, so that it is at all times under the control of the vintner, *without weakening its constitution by robbing it of a great amouut of foliage.*

2. *Judicious thinning of the fruit* at a time when no vigor has been expended in its development.

3. *Developing strong, healthy foliage*, by forcing the growth of the laterals and having *two* young, healthy leaves opposite each bunch, which will shade the fruit and serve as conductors of the sap to the fruit.

4. *Growing vigorous canes for next year's fruiting and no more*, thereby making them stronger; as every part of the vine is thus accessible to light and air the wood will ripen better and more uniform.

5. *Destruction of noxious insects.* As the vintner has to look over each shoot of the vine, this is done more thoroughly and systematically than by any other process.

FALL OR WINTER PRUNING.

This may be performed at any time, during mild days, while the vine is in a dormant state, generally from November to March, but should be done at least a week before vegetation is likely to commence. Tender varieties, which require covering, must, of course, be pruned in November.

Different varieties will require somewhat different treatment, some varieties (strong growers) will fruit better if pruned to spurs on old wood, than on the young canes, retaining the old canes and pruning the *healthy*, strong shoots or laterals they have to two buds, whereas, others (only moderate growers) will flourish and bear best when pruned short and to a cane of last season's growth.

The observing vintner will find some hints in our descriptive catalogue, but only by practice and experience can he learn the best method for each variety.

The following are the views of Mr. *Husmann* on this subject:

Some varieties will bear more readily and larger bunches upon the laterals of the *young* canes, some upon the spurs of a few eyes on *old* bearing branches, and some will fruit readily upon the principal canes. This should govern you in pruning.

Most of the *strong growers* of the Labrusca species, (Concord, Hartford, Ives, Martha, Perkins, etc.,) as well as some of its more vigorous Hybrids, (Goethe, Wilder, etc.,) and especially some Æstivalis, (Herbemont, Cunningham, Louisiana, Rulander,) *will fruit best on the laterals of the young canes of last summer's growth* provided they are strong enough, which they will be if they have been pinched according to our directions; the fruit buds at the base of the principal canes are seldom well developed, and will not bring much fruit. We therefore grow the fruit on the laterals, which can be shortened in to from two to six eyes each, according to their strength. All these rank growers should have plenty to do, that is they should be pruned long, much longer than is generally done. Should too many bunches appear, you can easily reduce the number at the first pinching. All the Cordifolia, and some of the Æstivalis class (Cynthiana and Norton's Virginia), *produce best on spurs on two or three year old canes*; they will also bear better on spurs on laterals than on main canes, but do not produce their best fruit until they can be "spurred in" on old arms. For this purpose, select for your spurs strong, well ripened shoots, cut them back two to three eyes each, and cut out all the small and imperfect ones. You may leave from thirty to fifty buds, according to the strength of your vine, and always bear in mind that you can reduce the number of bunches, when summer pruning.

A third class produces readily and abundantly from the main canes. This comprises the varities which do not grow very strong, the more *tender Labrusca* and all of more or less *Vinifera* characteristics, viz: the Alvey, Cassady, Creveling, Catawba, Delaware, Iona, Rebecca.—These will produce best on short canes of say six eyes, short pruning, and the old renewal plan may be as good as any for them. There is also much more danger of overtasking *this class* than both of the others, and *they* should never be allowed to bear too much.

Grape Culturist, Nov. 1870.

From the above it will be seen that *different methods* apply to different varieties, and we may add that they ought to be also modified according to other circumstances. Those, therefore, who have recommended various and contradictory systems of training and pruning may have each been right; but were wrong in believing their preferred method the only correct method *in all cases*, or equally well adapted for all species and varieties of grapes. Bearing this in mind the intelligent vintner will soon learn how far one or the other systems is best applicable in his case.

SUBSEQUENT MANAGEMENT.

We may now consider the vine as fully established, able to bear a full crop, and when tied to the trellis in spring, to present the appearance as shown in fig. 26.

(Fig. 26.)

The operations are precisely the same as in the third year. If you train your vines on the horizontal system, the upright canes, which were pruned back to two buds each, will now produce two shoots each, If more than one shoot should proceed from *each* of these *two* buds, or if other shoots should start from small

buds near the arms only the strongest one should be allowed to grow, and all others rubbed off. Instead of ten to twelve upright canes, you will have twenty to twenty four, and allowing three bunches to each, you may get seventy bunches to every vine, the fourth year after planting. These canes are now to be treated the same, as regards stopping, pinching laterals, etc., during each subsequent year of their growth.

There are many other modes and systems of training, but the same general rules and principles prevail in nearly all.

There is one well authenticated fact in the fruiting of the grape, viz: that the finest fruit, the best, earliest and largest crops are produced upon the strongest shoots of the previous years' growth. The only proper system of pruning will therefore be that which encourages and secures an abundance of such shoots. By this general principle all new systems, so called, should be proved, and beginners in grape culture may be able to guard against receiving false impressions with reference to any mode which may fall under their observation; and this caution is the more necessary as young vines will bear good crops for a *few* years, even under very indifferent treatment. In all systems of training which involve the retention of wood beyond five or six years, as in the case of spur pruning, and the methods with permanent horizontal branches, it is absolutely essential to remove the older wood at certain periods, and replace it with younger wood from near the base of the plant. Fixed rules can hardly be given for an operation which requires so much thought and such close acquaintance with the growth and bearing habits of the different varieties.

If you desire to train your vines *for arbors* or on walls, leave but one shoot to grow during the first summer, and if necessary even the second, so that it may get very strong. Cut back to three eyes in fall, these will each throw out a strong shoot, which should be tied to the arbor they are designed to cover, and allowed to grow unchecked. These three canes will be cut back in the fall following to three buds each, which will give us three principal branches, each with their canes the third or fourth season; of each of these branches, cut next fall one cane to two eyes, and the others to six or more buds, according to the strength of the vine, then gradually increase the number of branches and cut back more severely those which fruited. In this manner a vine can be made in the course of time to cover a large space, produce a large quantity of fruit, and get very old.

Those who desire further information and directions on various modes of pruning and training, or on the culture of grape vines in glass houses, we refer to Chorlton's Grape Growers' Guide; Fuller's Grape Culturist; Hoare's Cultivation of the Grape-vine on open Walls; and other books on Grape Culture, especially also to an article on Pruning and Training the Grape-vine, by Wm. Saunders, United States Department of Agriculture. Report, 1866.

DISEASES OF THE GRAPE VINE.

The vine, with all its vigor and longevity, is no less subject to diseases than all other organic bodies, and as we cannot remove most of their causes, and can even with the best care prevent and cure but few, our first attention must be given to the selection of healthy plants and of hardy varieties. You have already been warned against planting the Grape Vine in heavy, wet soil, where water stagnates, or in places exposed to early and late frosts. You have been impressed with the necessity of clean cultivation, stirring the soil,* of proper training, and of thinning the fruit. If you disregard these points, even the healthiest and most vigorous varieties of vines will become diseased.

"*The Mildew* is probably our most formidable disease. It is a fungus; two distinct kinds are infesting our vines. The one "*Odium Tuckeri*," of Europe, shows a powdery appearance on the *upper* surface of leaves, and frequently forms a somewhat leathery coating on shoots and berries. Its effects are to corrode and prevent the further swelling of the parts attacked. Grapes that are touched by it, will show an indurated spot, hard and brown, the portions of the berry not attacked, will swell out freely, and all that this hurt portion can do is to crack open, which it usually does, and the seeds may frequently be seen to protrude from this crack.

But the mildew most injurious to our native grapes is altogether different. This is a *Peronospora*, and shows itself on the *under* surface of the leaves, usually looking like a small patch of whitish-brown, downy matter. It adheres closely to the leaf, and is a perfect parasite; it destroys the part where it adheres, the sun burns a hole, and it is called blister, leaf-blight, etc. But if you say that it is mildew—oh, no! I never had any mildew. Being confined to the under surface of the leaves it escapes observation. This mildew is encouraged by continued damp, rainy weather, or even constant heavy dews, followed by still, balmy days; anything in fact that will prevent moisture from quickly leaving the foliage." *Wm. Saunders.*

* We are aware of the fact that in certain seasons and peculiar soils, neglected vineyards, filled with grass and weeds have escaped diseases and borne full crops, while well hoed and cultivated vineyards suffered severely, especially from *rot*; but the rule holds nevertheless good, in general. After a season of severe drouth, for instance, fall ploughing may cause the evaporation of the scanty remaining moisture in the loosened soil and render the exhausted roots a prey to severe frosts, while the unploughed, baked surface would serve as a protection against both. Such exceptions have misled some grape growers to advocate non-cultivation, or even grass sowing in their vineyards. But after a year or two a stunted growth, and unproductiveness of their vines was the result.

The European varieties are more subject to this disease than our indigenous sorts. In France and Germany it is successfully combated with flour of sulphur, early and often applied, on the lower surface of the leaves.* With our prices of labor it would scarcely be practicable except in cold graperies or garden culture, and it is best not to plant largely of those varieties which are very liable to this disease.

The Rot There are several kinds of *Rot* in the berries, (well known to all cultivators to their dismay,) specially prevalent in heavy soils and during wet seasons; (at least the dry climate of California seems a complete safeguard against both mildew and rot,) and whatever the causes, the best method to pursue is to choose varieties that are least liable to be affected, and to plant them upon well drained soil.

Sun-scald is another disease, or, probably, only another stadium of mildew. The leaves seem to become blistered or burnt; that portion injured will turn brown, and in a few days it becomes dry and crisp. If the leaves are much injured by sun-scald the fruit does not mature. (This shows the absurdity of removing the leaves to make the grape ripen better or sooner.) Sun-scald and mildew often go together, and vines affected by the one are very likely to be attacked by the other.

There is another species of fungus called *rust*, and some other diseases, but they are by far less injurious and formidable than the many noxious

INSECTS.

[Our limited space only permits us to briefly refer to a few of those insects which we have found most injurious in our own vineyards. These are, however, for the most part unnoticed in any of our standard treatises on the Grape-vine, and for the facts regarding them we are indebted to the valuable Entomological Reports of the State of Missouri.]

The Grape Phylloxera.

(*Phylloxera vastatrix.*)

Among the insects injurious to the Grape-vine none have ever attracted as much attention as the Phylloxera, which, in its essential characteristics, was unknown when the first edition of this little work on American Grape-vines was written. The gall-inhabiting type of this insect, it is true, was noticed by our grape-growers, many years ago, (especially on the Clinton) but they knew nothing of its root-inhabiting type. Even Fuller—who informs us that in Mr. Grant's celebrated grape-nurseries, (as far back as 1858) the men were in the habit of combing out, with their fingers, the roots of young vines to be sent off, in order to get rid of the knots—never mentions anything of this, nor of any root-infesting insect, in his excellent Treatise on the Cultivation of the Native Grape, though 16 pages are devoted to its insects. In the Spring of 1869 M. J. Lichtenstein, of Montpellier, first hazarded the opinion that the Phylloxera, which was attracting so much attention in Europe, was identical with the American Leaf-gall Louse, (first described by Dr. Asa Fitch, State Entomologist of New York, by the name of *Pemphigus vitifoliæ*); and in 1870, Prof. C. V. Riley succeeded in establishing the identity of their gall insect with ours, and also the identity of the gall and root-inhabiting types. The correctness of his views is confirmed by the subsequent researches of Prof. Planchon, Dr. Signoret, Balbiani, Cornu, and other scientists in France; lately also of Prof. Rœssler, in Klosterneuburg in Austria.*

After visiting France in 1871, and then extending his observations here, some of which were made in our Bushberg vineyards, Prof. Riley first gave us every reason to believe "that the failure of the European vine (*V. Vinifera*) when planted here, the partial failure of many hybrids with the European *Vinifera*, and the deterioration of many of the more tender-rooted native varieties, are mainly owing to the injurious work of this insidious little root-louse; also, that some of our native varieties enjoy relative immunity from the insects' attacks"—M. Laliman, of Bordeaux, having previously noticed the remarkable resistance of certain American vines in the midst of European vines dying from the effects of Phylloxera. The importance of these discoveries to grape culture cannot be too highly appreciated. The French Minister of Agriculture commissioned Professor Planchon, of Montpellier, to visit this country to study the insect here—the harm it does to our vines, or the power of resistance which these possess.† His investigations not only corroborated Prof. Riley's conclusions regarding the Phylloxera, but gave him, and through him to the people of Europe, a knowledge of the quality of our native grapes and wines, which will be very apt to dispel much of the prejudice against them that has so universally prevailed heretofore.

To discuss this subject as it deserves; to give a history of the Grape Phylloxera; the progress and extent of its ravages; the experiments made to prevent these; to review the influence which it had and probably will have on American grape-culture—would far exceed the scope of this brief manual. The literature of this subject would already fill a respectable library. We can here merely mention a few facts, and give some figures, which may enable the grape-grower to recognize and to observe this minute, yet so important insect; and we refer those who desire full and reliable information to Prof. Riley's Entomological Reports, especially the Sixth, for 1874, from which we cull largely. It will be understood that all the figures are very highly magnified, and that the natural sizes are indicated by dots within circles, or by lines.

The following figure of a grape leaf, shows the galls or excrescences produced by the gall-inhabiting type of the insect. On carefully opening one of the galls, we find the mother louse diligently at work surrounding herself with pale-yellow eggs, scarcely (.01) the one hun-

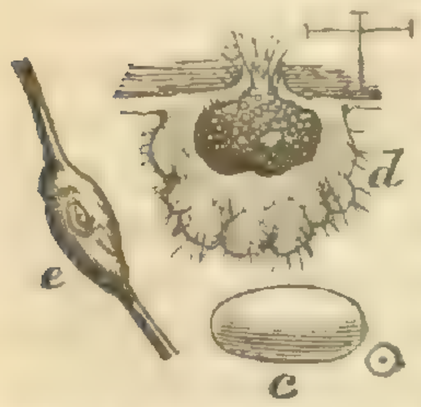
*The practice is to mix the sulphur with an equal quantity of fine air-slacked lime, and apply the powder with the aid of bellows, of which a very cheap style is manufactured for this purpose. The first application is made as soon as the blossoms are off, in June, and repeated once a month during the summer. The main point is to secure an even distribution in a dry time, and to make sure work, this application should be made before any signs of mildew appear, and repeated 3 or 4 times during the season.

*While this is going to press we learn from Dr. A. Blankenhorn, Carlsruhe, Germany, that the Phylloxera has just been found in three different places, (Annaberg, Carlsruhe and Worms) always on the roots of American vines, which, however, did not show the slightest symptom of disease.

† The full report of Prof. Planchon has just been published in the form of a most interesting little volume—"Les Vignes Americaines, leur résistance au Phylloxera et leur avenir en Europe." Paris 1875.

[Under side of Leaf covered with Galls.]

dredth part of an inch long, and not quite half as thick. She is about .04 inch long, of a dull orange color, and looks not unlike an immature seed of the common purslane. The eggs begin to hatch, when six or eight days old, into active little beings, which differ from their mother in their brighter yellow color, more perfect legs, etc. Issuing from the mouth of the gall, these young lice scatter over the vine, most of them finding their way to the tender terminal leaves, and commence pumping up and appropriating the sap, forming galls and depositing eggs, as their immediate parent had done before. This process continues during the summer, until the fifth or sixth generation. Every egg brings forth a fertile female which soon becomes wonderfully prolific.



[TYPE GALLICOLA: *c*, egg; *d*, section of gall; *e*, swelling of tendril.]

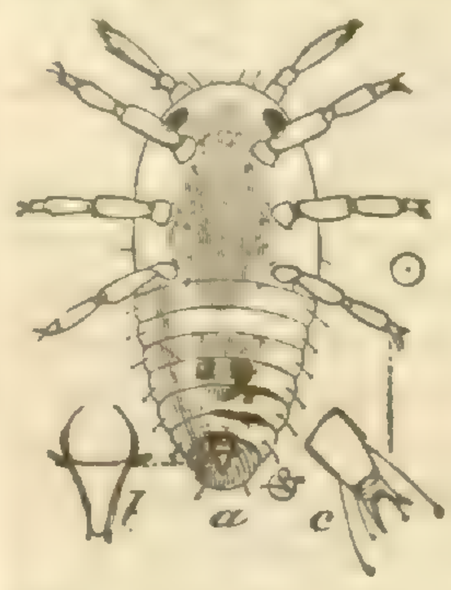
By the end of September the galls are mostly deserted and those which are left are usually infected with mildew, and eventually turn brown and decay. The young lice attach themselves to the roots, and thus hibernate. It is an important fact that the gall-inhabiting insect occurs only as an agamic and apterous female form. It is but a transient summer state, not at all essential to the perpetuation of the species, and does, compared with the other, or root-inhabiting type, but trifling damage. It flourishes only on the *Riparia*, more especially on the Clinton and Taylor; a few of its galls have been noticed on some other varieties, and abortive attempts are often made

[NEWLY HATCHED LARVA; *a*, ventral; *b*, dorsal view.]

[MOTHER GALL-LOUSE; ventral and dorsal views.]

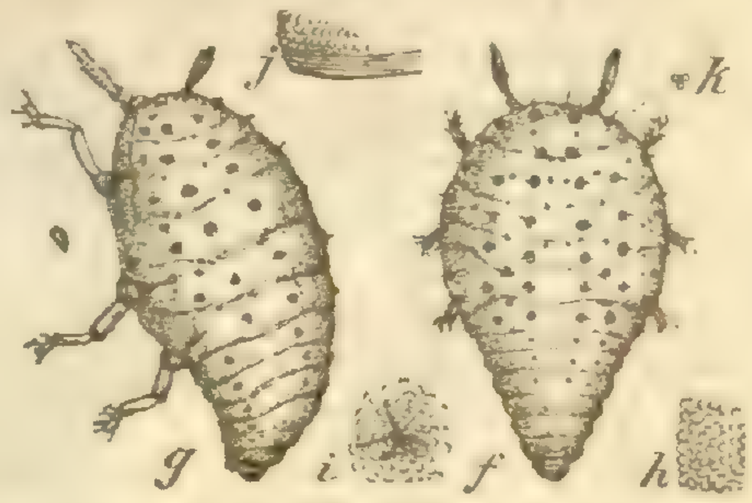
to found them on others. And in some seasons it is even difficult to find a few galls on the very vines on which they were very abundant the year before.

The root-inhabiting type of the Grape Phylloxera hibernates mostly as a young larva, attached to the roots, and so deepened in color as generally to be of a dull brassy brown, and therefore with difficulty perceived, as the roots are often of the same color. With the renewal of vine growth in the spring, this larva moults, rapidly increases in size, and soon commences laying eggs. These eggs in due time give birth to young, which soon become virginal, egg-laying mothers like the first, and like them, always remain wingless. Five or six generations of these egg-bearing mothers follow each other, when, about the middle of July, in the latitude of St. Louis, some of the individuals begin to acquire wings and continue to issue from the ground until vine-growth ceases in the fall. Having issued from the ground while in the pupa state, they rise in the air and spread to new vineyards, where they deliver themselves of their issue in the form of eggs, and then perish. In the course of a fortnight, these eggs which are probably deposited in the crevices on the surface of the ground, near the base of the vine, produce the sexual individuals, which are born for no other purpose than the reproduction of their kind, and are without means of flight or of taking food. They are quite active and couple readily.



[MALE PHYLLOXERA; Ventral View.]

Every piece of root having rootlets, taken from an infected vine during August or September, will present a goodly proportion of pupæ, and a glass jar filled with such roots and tightly closed, will furnish daily, for some time, a dozen or more winged females, which gather on the side of the jar toward the light. We may gather some idea from this fact of the immense number that disperse through the air to new fields, from a single acre of infected vines in the course of the late summer



[TYPE RADICICOLA; showing the tubercles by which it is distinguished from *Gallicola*.]

and fall months. We have, therefore, the spectacle of an underground insect possessing the power of continued existence, even when confined to its subterranean retreats. It spreads in the wingless state from vine to vine and from vineyard to vineyard, when these are adjacent, either through passages in the ground itself, or over the surface; at the same time it is able in the winged condition, to migrate to much more distant points.

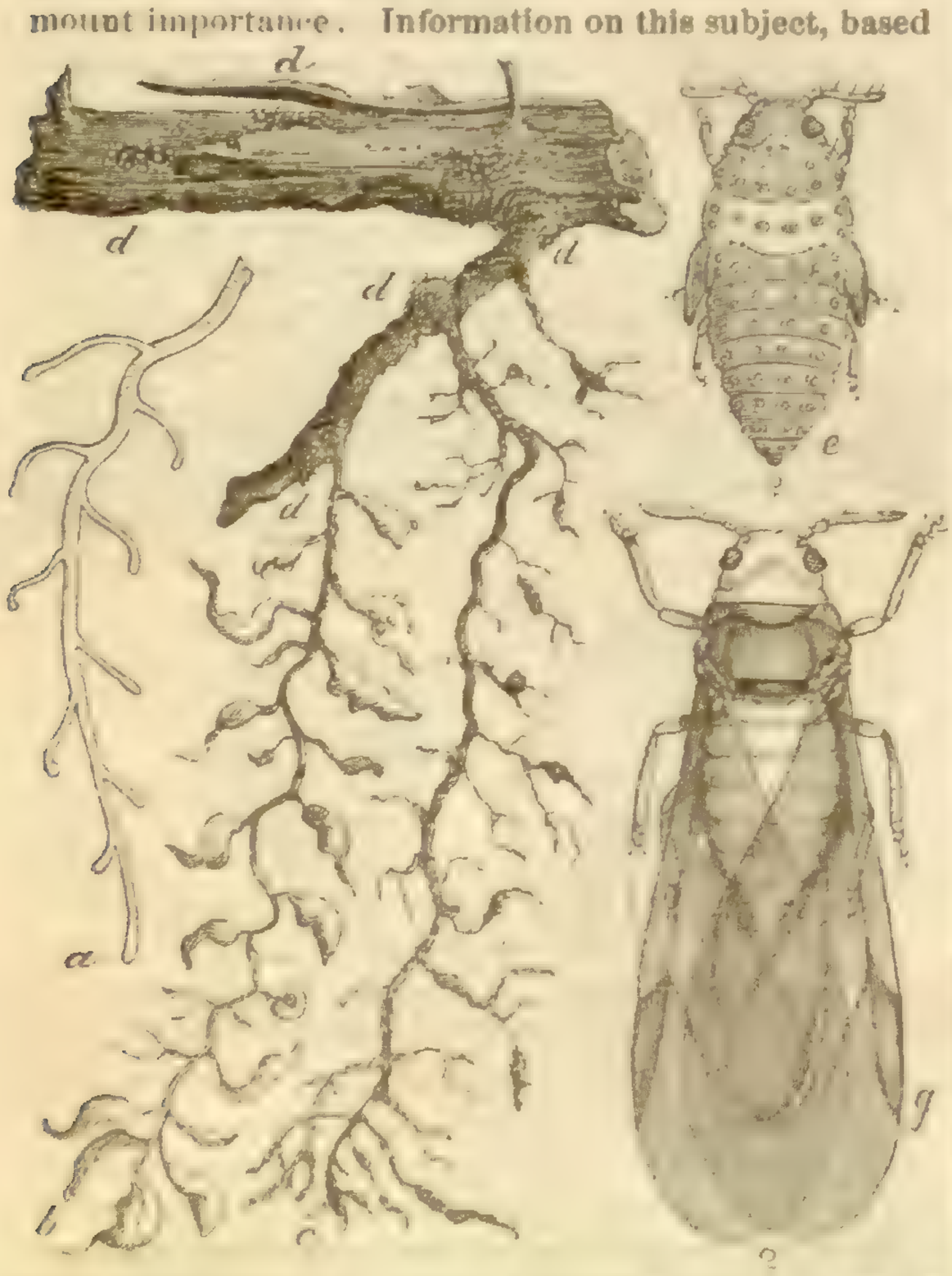
If to the above account we add that occasionally in-

dividuals, under certain conditions, abandon their normal underground habit, and form galls upon the leaves of certain varieties of grape-vines, we have in a general way, the natural history of the species.

The annexed figure shows the abnormal swelling of the rootlets, which follows the puncture of the root-louse; they eventually rot and the lice forsake them and betake themselves to fresh ones. As these decompose, the lice congregate on the larger parts beyond, until at last the root system literally wastes away.

During the first year of attack there are scarcely any outward manifestations of disease; only the second and third year—when the fibrous roots have vanished, and the lice not only prevent the formation of new ones, but settle on the larger roots, which also eventually become disorganized and rot—do the outward symptoms of the disease become manifest, in a sickly, yellowish appearance of the leaf, and a reduced growth of cane; and the vine dies. When the vine is about dying, it is generally impossible to discover the cause of the death, the lice having previously left for fresh pasturage.

As is frequently the case with injurious insects, the Phylloxera shows a preference for and thrives best on certain species, and even discriminates between varieties, or what amounts to the same thing, practically, some species, or varieties, resist its attacks and enjoy a relative immunity from its injuries. A knowledge of the relative susceptibility of different varieties to the attacks and injuries of the insect, is therefore of paramount importance. Information on this subject, based



[TYPE RADICICOLA:—*a*, shows a healthy root; *b*, one on which the lice are working, representing the knots and swellings caused by their punctures; *c*, a root that has been deserted by them, and where the rootlets have commenced to decay; *d*, *d*, *d* show how the lice are found on the larger roots; *e*, female pupa, dorsal view; *g*, winged female, dorsal view.]

on the researches of Prof. Riley, in addition to careful observation and experiments, made during the last four years by ourselves and our many correspondents in France and in this country, are contained in this catalogue, both in the "Description of Varieties" and in the notes to Dr. Engelmann's "Classification of Species" (Pages 4—12.)

The reasons why certain vines thus enjoy exemption while others so readily succumb, cannot be fully ascertained, but in a broad way it may be stated that there is a relation between the susceptibility of the vine and the character of its *roots*—the slow-growing, more tender-wooded and consequently tender-rooted varieties succumbing the most readily.

We see in the general resistibility of our purely native American vines against the Phylloxera, a remarkable verification of that law which Darwin has so ably established and aphoristically expressed, as "THE SURVIVAL OF THE FITTEST."

Professor Riley, in explaining "Why the insect is more injurious in Europe than here," says: "There exists a certain harmony between the indigenous fauna and flora of a country; and our native vines are such as, from their inherent peculiarities, have best withstood the attacks of the insect. The European vine, on the contrary, succumbs more readily, not only because of its more tender and delicate nature, but because it has not been accustomed to the disease—there being, doubtless, a parallel between this case and the well-known fact that diseases and parasites which are comparatively harmless among peoples long accustomed to them, become virulent and often fatal when first introduced among hitherto uncontaminated peoples. Then the particular natural enemies of the insect which belong to its own class, and which in this country help to keep it within due bounds, are lacking in Europe; and it will require some time before the closely allied European predaceous species will prey upon and check it there to the same extent. The Phylloxera will, also, all other things being equal, have an advantage in those countries where the mildness and shortness of the winter allow an increase in the annual number of its generations. Finally, the differences in soil and in modes of culture have no insignificant bearing on the question in hand. Though Phylloxera, in both types, is found on our wild vines, it is very doubtful if such wild vines in a state of nature are ever killed by it. With their far-reaching arms embracing shrub and tree, their climbing habit unchecked by the pruner's knife, these vines have a corresponding length and depth of root, which render them less susceptible to injury from an under-ground enemy. Our own method of growing them on trellis approaches more nearly these natural conditions than that employed in the ravaged French districts, where the vines are grown in greater proximity and allowed to trail upon the ground, or are supported to a single stake."

Again, after speaking of the large numbers of winged females rising from the ground during late summer and fall, he adds the following cogent reason in a recent number of the *New York Tribune:* "The winged female Phylloxera is wafted about, and will lay her eggs, or, in other words, deliver herself of her progeny, wherever she happens to settle. If this be upon the grape vine, well and good—the young live and propagate, if

upon other plants, they perish. We thus have the spectacle of a species annually wasting itself to a greater or less extent, just as in the vegetable kingdom most species produce a superabundance of seed, the larger portion of which is destined to perish. Thus in the thickly planted vine districts of France, few winged insects would fail to settle where their issue could survive, while in America, an immense number annually perish in the large tracts of other vegetation intervening between our vineyards."

Under the stimulus of a large reward (300,000 francs) appropriated for the purpose by the French Government, innumerable plans have been proposed and experiments made during the last five years, but *no remedy* has yet been discovered which gives entire satisfaction, or is applicable to all conditions of soil. Submersion is an efficacious remedy, but on most and especially on the best hilly vinelands, submersion is impracticable. An admixture of sand in the soil is also of service, as the root-louse does not thrive on sandy soils. Sulpho-carbonate of potassa and coal-tar are now mentioned as capable of destroying the Phylloxera, and Mr. Marés as President of the Ministerial Commission, in his report on the various (140) modes of treatment tried in 1872 to 1874, states that manures rich in potash and nitrogen, mixed with alkaline or earthy sulphates, refuse of salt-works, soot, wood-ashes, ammonia, or fat-lime, have given the best result. Prof. Rœssler also believes in fighting the insect with manure and phosphates, ammonia and potash, which treatment succeeds in porous soils; and to obtain this porosity he made use of dynamite, raising the soil from a great depth without injuring the vines. He then puts some chalk and phosphorus at the foot of the stock and irrigates. A gas is disengaged by the humidity, which destroys great quantities of insects. But the grape growers seem not to believe in these medicinal insecticides, or consider them impractical, too costly, and their application too laborious. Many prefer in a great measure to resort to planting American vines, mostly with a view to graft thereon their own varieties. In Germany, however, the importation of our vines and cuttings has been prohibited by law, to prevent the introduction of the dreaded insect.

While this may be a wise precaution where the insect does not exist, we fear that it comes *too late*. Its existence for several years in France, in England also, and its having been discovered in Switzerland and in several localities in Germany, all tend to thwart the very object of this prohibition, which is to preserve the German vineyards from infection. Riley and Planchon have established the fact that the insect is indigenous to the N. American continent, east of the Rocky Mountains, and there is little doubt but that it was first imported into Europe on American vines. Yet it must not be supposed that our American vines are all necessarily infested with Phylloxera, or that the insect has been introduced in every locality where our vines have been planted. On the contrary there are localities where, from the isolated nature of the vineyards, or the nature of the soil, it is difficult to find the insect, and like many other indigenous species, it is in some years very numerous and injurious; in others scarcely to be seen. There is no positive evidence yet that it can be imported on cuttings, though such transport is not impossible. It should be recollected also that vines imported in late winter or early spring, cannot possibly carry the insect, even if infected, in any other than the egg or larva form; as no winged insects are then in existence, to escape on the way, or upon opening the cases. While, therefore, we recognize the wisdom of prohibiting the importation of American vines into non-infected districts, it would seem unwise to cut off from those districts already infected, the use of American vines, which withstand the insect's attacks; and the danger of importing the insect would be avoided if the plants or cuttings upon being unpacked were placed in a bath of strong soapsuds. The greatness of the evil, however, even justifies extreme measures.

The Grape Leaf-hopper.

(*Erythroneura vitis.*)

Very generally but erroneously called *Thrips*. This is one of the most troublesome insects the grape-grower has to deal with. It is a very active little thing, running sideways like a crab, and dodging round quickly to the other side when approached It jumps with great vigor, and congregates in great crowds upon the under side of the leaf, pumping up the sap, and thus causing numerous brown dead spots, and often killing the leaf entirely. A vine badly infested with these leaf-hoppers wears a speckled, rusty and sickly appearance, while the leaves often drop prematurely and the fruit in consequence fails to ripen. There are several species attacking the Vine—all belonging to the same genus, however, and only differing in color. The natural history of this insect is not recorded by entomologists, but Prof. Riley informs us that the eggs are thrust into the leaf-stems. Tobacco-water and soapsuds are recommended, in the books, to be syringed on the vines as a remedy; but we would recommend passing between the rows with a torch in the evening, smearing the stakes in Spring with soft soap or other sticky substance, and burning the leaves in the Fall. The hoppers fly to the light of the torch; and as they pass the winter under leaves, loose bark of the stakes, etc., cleanliness in and about the vineyard is of the first importance in checking their ravages. The torch remedy is most effectual when three persons work in company, one between two rows with the torch, and one on the further side of each of the rows to give the trellis a slight shake and disturb the hoppers.

The Grape Leaf-folder.

(*Desmia maculalis.*)

This is a worm of a glass-green color, very active, wriggling, jumping and jerking either way at every touch. It folds rather than rolls the leaf, by fastening two portions together by its silken threads. The chrysalis is formed within the fold of the leaf. The moth is conspicuously marked with black and white, all the wings being bordered and spotted as in the annexed

GRAPE LEAF-FOLDER.—1, larva; 2. head and thoracic joints enlarged; 3, chrysalis; 4, 5, male and female moths.]

figures. The male is distinguished from the female by his elbowed antennæ, thickened near the middle, while those of the female are simple and thread-like. The moths appear in early Spring, but the worms are not numerous till mid-summer. A good method to destroy the worms is by crushing them suddenly with both hands, within the leaf. The last brood hybernates in the chrysalis state, within the fallen leaves, and much may be done towards checking the ravages of this worm, which during some years are very severe, by raking up and burning the dead leaves in the Fall.

THE GRAPE-VINE FIDIA.

(*Fidia viticida.*)

This beetle, often miscalled the Rose-bug, is one of the worst foes of the Grape-vine in Missouri. It makes its appearance during the month of June, and by the end of July has generally disappeared. When numerous it so riddles the leaves as to reduce them to mere shreds. Luckily this beetle drops to the ground upon the slightest disturbance, and thus enables us to keep it in check, by taking a large basin, with a little water in it and holding it under the insect. At the least jar the bugs will fall into the dish. When a quantity have thus been caught, throw them into the fire or pour hot water upon them. Mr. Poeschel, of Hermann, raised a large brood of chickens and had them so well trained that all he had to do was to start them in the vineyard with a boy in front to shake the infested vines, and he himself behind the chicks. They picked up every beetle that fell to the ground; and next season he could scarcely find a single Fidia.

THE GIGANTIC ROOT-BORER.

(*Prionus laticollis.*)

This large borer is often met with in and about the roots of several kinds of plants, such as the Apple, the Pear, and the Grape, to which it is very destructive. It follows the roots, entirely severing them in many instances, so that the vines soon die. When fully grown it leaves the roots it was inhabiting, and forms a smooth, oval chamber in the earth, wherein it assumes the pupa form. If the roots are larger it remains within them to undergo its changes. The perfect insect is a large, dark brown beetle, which first appears toward the end of June, and is very commonly found during the Summer and Fall months, rushing, often with a heavy noisy flight, into lighted rooms. Prof. Riley has shown that this borer not only attacks living trees and vines, but that it also breeds in dead oak stumps, and can travel through the ground from one place to another; from which facts he draws the important corollary that it will not do to leave oak stumps to rot on ground which is intended for a vineyard—a fact which our experience corroborates. Little can be done in the way of extirpating these underground borers, their presence being only indicated by the death of the vine. Wherever you find vines suddenly dying from any cause unknown, search for this borer, and upon finding one, (in each case we have found but *one* at each tree or vine) put an end to his existence.

THE GRAPE-VINE FLEA-BEETLE.

(*Haltica chalybea.*)

[*a*, larva, natural size; *b*, do. magnified; *c*, cocoon; *d*, beetle enlarged.]

Like all Flea-beetles, this insect has very stout swollen hind thighs, by means of which it is enabled to jump about very energetically, and is consequently very difficult to capture. The color of the beetle varies from steel-blue to metallic-green and purple. The beetles hibernate in a torpid state under any shelter, such as loose bark, crevices of stakes, etc., and they are roused to activity quite early in the spring, doing the greatest damdamage at this early season by boring into and scooping out the unopened buds. As the leaves expand, they feed on these, and soon pair and deposit their small orange eggs in clusters on the underside of the leaf. These eggs soon hatch into dark-colored larvæ, which may be found of all sizes during the latter part of May

and early part of June, generally on the upper side of the leaf, which they riddle, devouring all but the largest ribs. A dusting of dry lime kills the larvæ, but the beetle has to be caught and killed.

The Grape-berry Moth.

(*Lobesia botrana.*)

[*a*, moth; *b*, worm; *c*, hole made in berry; *d*, rotting berry, caused by worm.]

This insect first attracted attention about seven years ago. About the first of July the grapes that are attacked by the worm begin to show a discolored spot at the point where the worm entered. Upon opening such a grape, the inmate will be found at the end of a winding channel. It continues to feed on the pulp of the fruit, and upon reaching the seeds, generally eats out their interior. As soon as the grape is touched the worm will wriggle out of it, and rapidly let itself to the ground, by means of its ever ready silken thread, unless care be taken to prevent its so doing. The cocoon is often formed on the leaves of the vine, in a manner essentially characteristic: the worm cuts out a clean oval flap, leaving it hinged on one side, and rolling the flap over, fastens it to the leaf, and thus forms for itself a cozy little house in which it changes to a chrysalis. In about ten days after this last change takes place, the chrysalis works itself out of the cocoon and the little moth, represented in the figure (hair lines showing natural size), makes its escape. As a remedy we recommend picking up all fallen berries and converting them into vinegar; as upon racking off the juice and water, countless numbers of these worms are found in the sediment. This insect was named *Penthnia vitivorana*, by Dr. Packard, in this country, but Prof. Riley informs us that it is probably an importation from Europe, where it is known as *Lobesia botrana*.

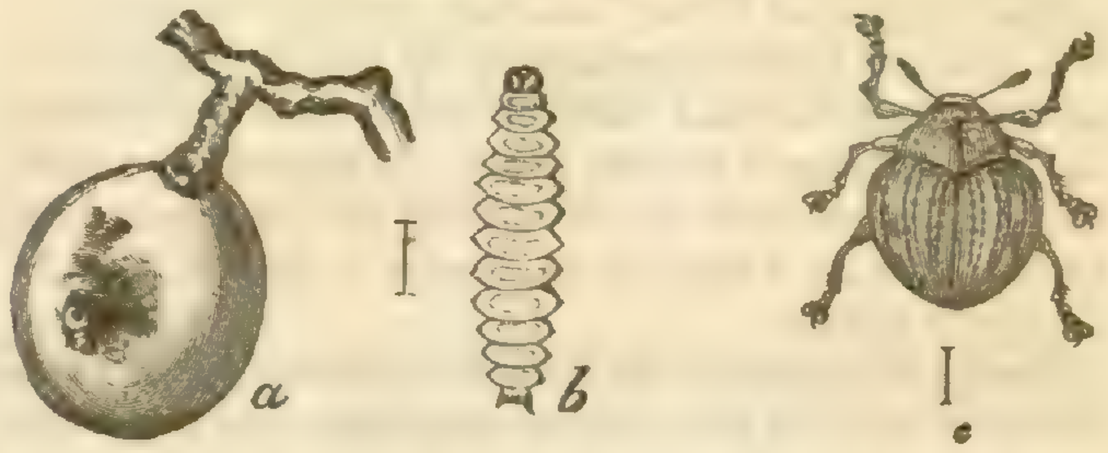
The Rose-chafer.

(*Macrodactylus subspinosus.*)

This is the true "Rose-bug," injurious to many plants, but especially hard on grape-vines during some years. In Prof. Riley's words: "It is one of those species whose larva develops under ground, and cannot be very well dealt with in this stage of its life. We must contend with it in the beetle form, and there is no other effectual means than by hand-picking, or by shaking into vessels and on to sheets. This work can be greatly facilitated by taking advantage of the insect's tastes and preferences. It shows a great predilection for the Clinton, and its close allies, of all other varieties of the Grape-vine, and will gather upon that variety and leave others unmolested, where it has a chance. Those who are troubled with this beetle will no doubt take the hint."

The Grape Curculio.

(*Cœliodes inæqualis.*)



[*a*, berry infested; *b*, larva; *c*, beetle; the hair line showing natural length.]

The larva of this curculio infects the grapes in June and July, causing a little black hole in the skin, and a discoloration of the berry immediately around it, as seen in the above figure. From the middle to the last of July this larva leaves the berry and buries itself a few inches in the ground, and by the beginning of September the perfect insect issues from the ground and doubtless passes the winter in the beetle state, ready to puncture the grapes again the following May or June. This curculio is small and inconspicuous, being of a black color with a grayish tint. It is represented above, the hair line underneath showing the natural size. This insect is very bad some years, at others scarcely noticed, being doubtless killed by parasites. It is thus that nature works: "Eat and be eaten, kill and be killed," is one of her universal laws, and we can never say with surety because a particular insect is numerous one year, therefore it will be so the next.

All infested berries should from time to time, as they are noticed, be collected and destroyed, and the beetle may be jarred down on sheets as with the Plum Curculio.

There are several CUT WORMS, which eat the young, tender shoots of the vine, and draw them into the ground below; they have destroyed, or kept back at least, many a young vine. The little rascals can be easily found and destroyed by digging for them under the loose clods of ground beneath the young vine.

There are many other insects injurious to the Grape-vine—large solitary worms—insects which lay eggs in the canes—others which make curious galls, etc.; but the reader who desires an acquaintance with these, must refer to Prof. Riley's reports.

Besides the insect, you will have yet other enemies to combat; foxes and birds, and, worst of all, some two-legged beings in human shape—thieves—who will steal your grapes if you do not watch and threaten to keep them off with powder and shot. We do.

GATHERING THE FRUIT.

Whether it be for the table or for wine, do not pick the grape before it is fully ripe. Every grape will color before ripe; some do so several weeks before, but when thoroughly ripe the stem turns brown and shrivels somewhat. In the finest qualities, the sweetness and aroma of the grape juice are fully developed only in the perfectly matured grape; and we consider the *late* ripening varieties as far superior, especially for wine, to the *early* kinds; but, of course, only in such localities where

late grapes will mature. This noble fruit does *not* ripen, like some other fruit, after being gathered. Always gather the grapes in fair weather, and wait till the dew has dried off before commencing in the morning. Cut off the clusters with a knife or shears, and clip out the unripe or diseased berries, if any, taking care however, that the bloom shall not be rubbed off, nor any of the berries broken, if they are to be sent to market, or to be kept into winter.

For *packing* grapes for market, shallow boxes, holding from three to ten pounds, and especially manufactured for the purpose in all the principal grape regions, costing about one cent per pound, are used. In packing, the *top* is first nailed on and a sheet of thin white paper put in; whole bunches of grapes are first put in; the vacant places left are filled with parts of bunches, so that all the space is occupied and the whole box packed, as closely and as full as possible, without jamming. Another sheet of paper is now laid on and the bottom nailed down. By this means, when the boxes are opened, only entire bunches are found at the top.

Grapes could be easily preserved for months if you had a cool room or cellar, where the temperature could be kept between 35° and 40°. In a warm, damp atmosphere, grapes will soon rot. Mr. Fuller recommends, for preserving grapes, to bring them first into a cool room, spread them out and let them remain there for a few days, until all surplus moisture has passed off; then pack them away in boxes, placing the bunches close together, and thick sheets of paper between each layer. When the boxes are filled put them away in a cool place; examine them occasionally and take out the decayed berries, from time to time, as they appear. If the place is cool and the fruit *ripe* and sound, they will keep three to four months. Another method by which grapes are sometimes successfully preserved till late in March, especially in France, is this: cut a branch having two bunches of fruit attached and place the lower end in a small bottle of water, through a perforated cork; seal the upper cut end of the branch and also the cork with sealing wax. A little charcoal in the water preserves its purity. The bottles are then placed in a dry cool room, where the temperature is pretty even and never falls below freezing point, and are kept in an erect position (usually by a rack made for the purpose) care being taken that the clusters do not touch each other and that every imperfect grape be removed as fast as it shows signs of failing. But very few persons however, can bestow this care and still less have a fruit room or cellar, that can be kept so cool (40°).

Lately we have seen and tasted Concord grapes, kept fresh and beautiful, in a porous, unglazed earthen jar, manufactured for this purpose by T. J. Price, Macomb, Ills., who says: "The clusters are to be laid carefully in them as soon as picked, and then taken to the cellar or basement, or some cool place where they can have both ventilation and moisture; if they are put in a room above ground, sprinkle the floor occasionally, and let them have the night air until cold freezing weather. The pores of these jars are filled with a salt solution, as they come from the kiln, then the inside coated with a common thick limewash. The salt solution in the pores is intended to absorb the moisture and thus to produce a cool and even temperature inside the jar, and the lime is to prevent mould. These jars can be used again from year to year, only they should be first soaked in strong brine and then whitewashed inside, before they are filled again with grapes." If grapes will keep so easily, and in as fine condition as we have seen them last January (1875), these jars are really a valuable novelty. [We have none of these jars for sale, nor do we know where they can be obtained, except, perhaps, from the manufacturer.]

The best mode of preserving the delicious juice of the grape, with its delightfully nutritious constituents, in a concentrated and almost imperishable form, is by

WINE MAKING.

"Wine is like rain—falling on dirty ground, it augments dirt;
—on good soil, it becomes a blessing."—*Mirza Shaffy*.

We have been urged to embody in this Manual a chapter upon this subject, and we intended to do so, but the very attempt to write it only proved to us most conclusively, that it is *impossible* to furnish, within the limited scope of this Catalogue, anything that would be valuable, either as a guide to the inexperienced, or as a *vade mecum* to the wine-maker.

The intelligent farmer and amateur grape grower who desires to transform his surplus fruit into that innocent, health-giving beverage, "Wine," we refer to *Remelin's* Wine Makers Manual, and *Husmann's* Grapes and Wine. The professional, experienced vintner will not look to this little Manual for information, and those grape growers who desire to make wine on a large scale, without possessing themselves sufficient knowledge for doing it—we can only advise to engage some experienced man who knows how to treat wines; and there are already plenty of them in this country. It need not be a Professor of Chemistry, who may only adulterate the wines by his scientific manipulations; on the contrary, we would prefer a plain "wine cooper," one who is used to attend to wines himself from his youth, to watch them with the care and cheerfulness of a mother to her infant, and who will not permit your wines to leave his nursing hands before they *are and will keep* clear and perfect, racking off and filling up whenever required, and keeping not merely your casks and bottles, but every part and corner of your cellars most admirably clean.

If you should say that you cannot afford to keep such a man, then, we say, you cannot afford to build cellars either; and you would do best to associate for the purpose with one or more of your neighbor grape growers. But if you *have* your own cellars and plenty of grapes, you can certainly afford to pay such a man, and to pay him *well*, at least until you or your sons have learned from him.

Then only shall we be able to produce *the best*, to establish a reputation for American wines equal to those of Europe, and to compete with them; then only shall we be able to provide for ourselves and for the people of this continent, that healthy and delicious beverage, known for all times to be the promoter of civilization; excessive whisky drinking will gradually vanish; our national temperament will be more joyous and happy, and grape growing permanently profitable.

DESCRIPTIVE CATALOGUE.

NOTE TO THE READER.—The following descriptions of our American varieties are probably the most complete that have so far appeared; but all description by words must necessarily be inadequate, and even figures are but insufficient aids. It is only by familiarizing oneself with the characteristics of the *species* to which each variety respectively belongs, that these descriptions become thoroughly intelligible; we have, therefore, coupled with each variety the species to which it seems most closely allied, or from which it originated. First is given the standard name in **Full-face** type; then the synonyms in SMALL CAPITALS, then the species in *Italics*, abbreviating them thus: *(Cord.)* for Cordifolia or rather Riparia; *(Labr.)* for Labrusca, and *(Æst)* for Æstivalis. (see pages 6 to 10).

The descriptions of varieties which are *discarded*, and not propagated by us, also of new varieties which are not yet disseminated, are printed in smaller type. The descriptions of the more important varieties, printed in larger type, contain notes on their *roots* and *woodgrowth*, given for the first time, and based on our observations only. Under different conditions of soil, climate, and other circumstances, they might vary somewhat. In speaking of the canes and *woodgrowth* we refer to the natural habit of canes of thrifty, healthy vines, permitted to grow in a natural way, unrestrained by pinching or training to a given system.

Where the weight of must is recorded, it is to show the *sugar* in *degrees* on Oechsle's scale, and the acid in mills by Twitchell's acidometer.

Adirondac. (*Labr.*) Originated at Port Henry, Essex Co., N. Y.; (first noticed 1852.) Probably a seedling of the Isabella, being much like it in growth and foliage. Ripens very early—about the same time as the Hartford Prolific. *Bunch* large, compact, not shouldered; *berry* large, oblong, black, covered with a delicate bloom, transparent, with a tender pulp; thin skin; juicy and vinous; quality *best*, "when you can get it."—"Unreliable."—"The nearest approach to a foreign grape."—*Husmann*.

Reports *not* generally satisfactory. A slow, tender grower. Young vines have mildewed, and older ones need protection. Blooms early, and fruit destroyed by late frosts. Roots very weak and tender. *Wine*, agreeable flavor, low in sugar and acid.

Advance. One of Mr. Rickett's* new seedlings, a cross between Clinton and Black Hamburg. "A superior grape, and, as a whole, perhaps in advance of all his others. The *berry* is black, with a slight blue bloom, roundish oval; *bunch* large, long and shouldered; flesh too good to describe, except pomologically, and then I think it would read 'best.'"—*F. R. Elliot, N. Y.*

Bunch large, *berry* medium, thin skin, scarcely any pulp; sweet and very sprightly—decidedly the best early grape we have yet met with. Vine healthy, vigorous and productive, but the fruit rotted badly this season. Fully ripe at this time, July 30, 1874.—*Sam. Miller, Bluffton, Mo.*

Alexander. SYNS: CAPE, BLACK CAPE, SCHUYLKILL MUSCADEL, CONSTANTIA, SPRINGMILL CONSTANTIA, CLIFTON'S CONSTANTIA, TASKER'S GRAPE, VEVAY, WINNE, ROTHROCK of Prince, YORK LISBON. (*Labr.*) This grape was first discovered by Mr. Alexander, gardener to Gov. Penn, on the banks of the Schuylkill, near Philadelphia, before the war of the revolution. It is not unfrequently found, as a seedling from the wild Fox Grape, on the borders of our woods. American grape culture proper began with the planting of this variety, at the beginning of our century, by a Swiss colony, at Vevay, in Switzerland county, Indiana, on the Ohio River, forty-five miles below Cincinnati. It was for some time supposed to be the famous grape of the Constancia colony, on the Cape of Good Hope. Whether John James Dufour, the respected leader of that Swiss colony, shared that error, or whether he deemed it necessary to leave them in this error—while he had the sagacity to discover that their former failures (in Jessamine County, Ky., 1790—1801) were caused by planting *foreign* grape vines, and intentionally substituted a native variety—we do not know; certain it is that this was the first successful attempt to establish vineyards in our country. A very good wine, resembling claret, was made from the *Cape*, and it was the favorite of former days, until it was displaced by the Catawba. (The *White Cape* is similar to above, differing only in its color, which is greenish white.) *Downing* describes it as follows: "*Bunches* rather compact, not shouldered; *berries* of medium size, oval; skin thick, quite black; flesh with a very firm pulp, but juicy; makes a very fair wine, but is quite too pulpy and coarse for table use, though quite sweet and musky when fully ripe, which is not till the last of October. Leaves much more *downy* than those of the Isabella." *W. R. Prince*, in his Treatise on the Vine, N. Y., 1830) enumerates eighty-eight varieties of American grapes, but "for profit can only recommend the Catawba and the Cape; one tenth of the latter variety would be enough. Of the two recommended above, the Catawba is much the most productive, but the *Cape is less subject to rot.* Both make good wines."

*See *Rickett's* Seedling Grapes.

AGAWAM. (Rogers' Hybrid No. 15.)

Agawam. (Rogers' Hybrid No. 15.) Raised by E. S. Rogers, of Salem, Mass., and considered by him as his best variety, before the introduction of the Salem. It is a dark red or maroon grape, of the Hamburg cross; *bunches* large, compact, often shouldered; *berries* very large, roundish; skin thick; pulp soft; sweet, sprightly, of peculiarly aromatic flavor, and a little of the native aroma; productive, and of great vigor of growth; *roots* stout, fleshy and moderately fibrous, with a thick, smooth liber. Canes very stout, moderately long, with comparatively few but strong laterals. Wood of average hardness, and medium sized pith. Buds large and prominent. Ripens soon after the Concord. Reports generally satisfactory; succeeds well. In some localities it has been subject to mildew and rot, and Mr. Husmann says: Its strong flavor is to me far from agreeable. The character of the cluster and leaf is shown in above figure.

Adelaide. One of Jas. H. Rickett's new grapes; a hybrid between Concord and Muscat Hamburg. It is described as of medium size; berry of oval shape, black, with light blue bloom; of a sweet but sprightly flavor; purplish red flesh.

Aletha. A seedling of Catawba, originated at Ottawa, Ill.; said to ripen ten days in advance of Hartford Prolific. Described in *Prairie Farmer*: "*Bunches* medium size, stem long; *berries* hanging rather loosely; skin thick, color dark purple; juice nearly black, staining the hands and mouth. Flesh quite pulpy, with a decided foxy aroma; in foxiness and astringency it is much the same as a well ripened Isabella." Said to promise well as a wine grape for northern localities. Not yet disseminated, which is not to be regretted, judging from the above description.

Albino. Syn: GARBER'S ALBINO. (*Labr.*) Raised by J. B. Garber, Columbia, Pa., (supposed to be a seedling of Isabella.) *Bunch* small; *berry* nearly round, slightly oval; yellowish or amber color. Flesh acid; tough; too late for the north.—*Chas. Downing.*

Allen's Hybrid. Raised by J. F. Allen, Salem, Mass.; a cross between the *Golden Chasselas* and the *Isabella;* the first of American hybrid grapes. Ripens early, about with the Concord. *Bunches* large and long, moderately compact; *berries* full medium to large; skin thin, semi-transparent; color nearly white, tinged with amber; flesh tender and delicate, without pulp, juicy and delicious; has a mild, muscat flavor; quality best. The leaves have a peculiar erumpled appearance, and partly foreign character. It is apt to mildew and rot, and can not be recommended for general culture, though it is worthy a place in amateur collections.

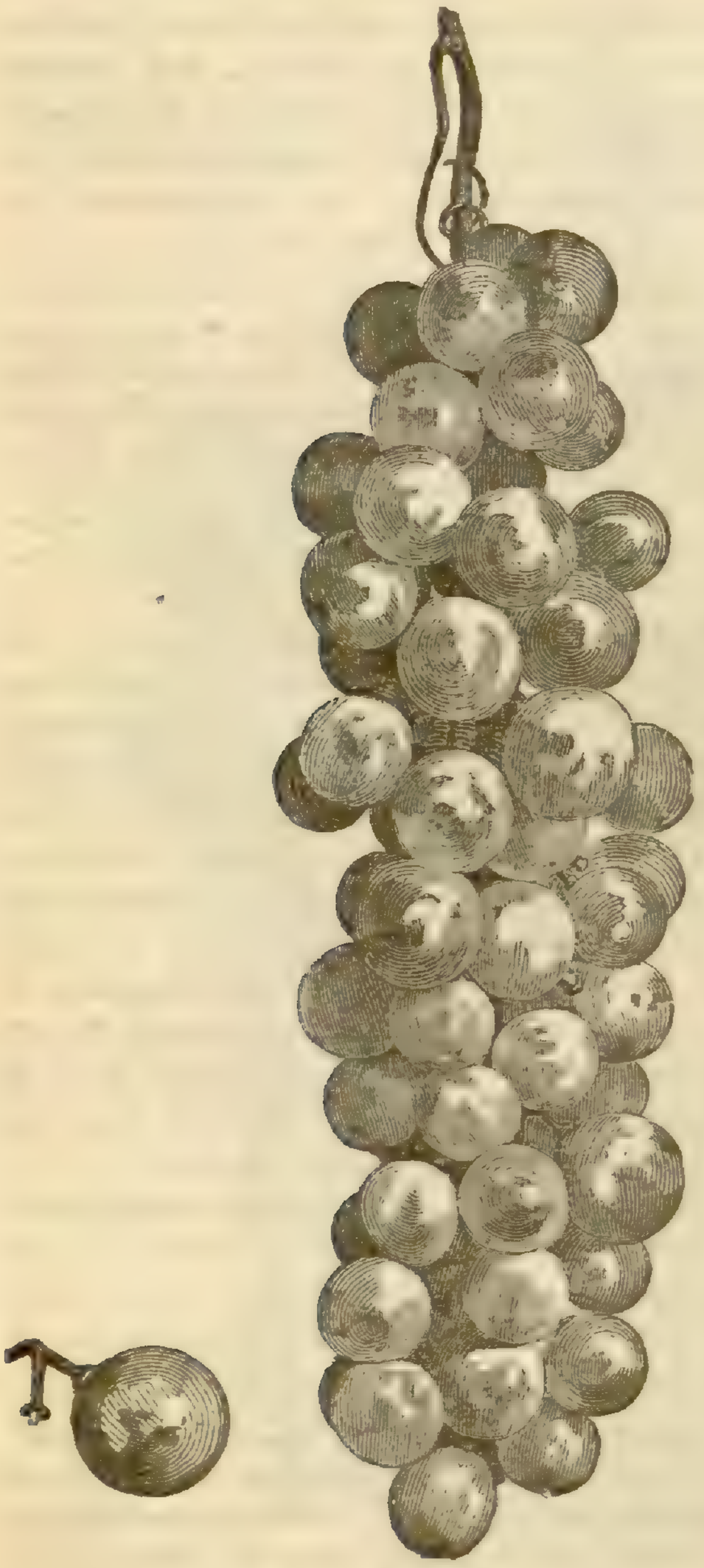
Alvey. Syn: HAGAR. Introduced by Dr. Harvey, of Hagerstown, Md. Generally classed with *Æst.*, but its characteristics point to a different species. Its erect growth, soft and short jointed wood, rooting very easily from cuttings; its roots feeble, and incapable of resisting the Phylloxera; the exquisite quality, pure vinous flavor—all point to the *Vinifera*, and force us to the conclusion that *Alvey* originated from an intermixture of Vinifera and Æstivalis, crossed by natural hybridization. *Bunches* medium, loose, shouldered; *berries* small, round, black; sweet, juicy and vinous, without pulp; a slow grower, making a stout short-jointed wood; moderately productive; *roots* medium thick, more inclined to the wiry character of the Æstivalis class, with a medium smooth liber. Canes remarkably straight and upright, gradually tapering, and not inclined to ramble like most American varieties. Laterals few and feeble; wood rather soft, and with a large pith. These characteristics, together with its thin skin and total absence of pulp, strongly indicate a foreign character. Excellent in quality, and makes one of the *best* red wines, but is apt to drop its leaves on southern slopes; seems to prefer the deep rich, *sandy* loam of our northeastern or even northern slopes. Must 85°—91°.

Amanda. (*Labr.*) Description in our former edition, copied from Catalogue of Bluffton Wine Co., (and Hort. Annual, 1868) totally differs from the fruit which we obtained from plants of same source. We asked friend Sam. Miller, at Bluffton, and he says: "It is a *large* black, thick-skinned, hard-pulped grape, a showy, but vile Fox." This corresponds with our experience, and we discard it. It may be the same as "August Pioneer."

Aminia. (Supposed Rogers' No. 39.) In Fall of 1867 we tried to get those of Rogers' unnamed hybrids, which we had not yet tested, and aware of the confusion existing as to their numbers, we obtained a few of each No. from different sources at the same time. Of those which we planted as No. 39 three survived, but not two of them were alike. One of them proved especially valuable. To ascertain if this were the true No. 39 we addressed Mr. E. S. Rogers, to let us have a plant or a graft of the original stock of his No. 39, but were informed that the original stock was lost!

One of our vines No. 39 proved so valuable, that we determined to propagate it, and planted fifty vines thereof, while we destroyed the other two. From the commendation given to No. 39 at the quarter-centennial session of the Am. Pomol. Society, by its president, the Hon. M. P. Wilder, we have the more reason to suppose that ours is the true No. 39; but to avoid confusion with others which may be sent out by other propagators, under this number, and which may or may not be the same, we gave ours the name Aminia. *Bunches* medium, slightly shouldered, moderately compact, more even, and better on an average than Rogers' grapes generally make; *berries* full medium to large, dark purple, nearly black, with a fine bloom. Flesh melting, with but little pulp, sweet and of fine flavor, ripening very early, about with the Hartford Prolific. We consider it one of our *earliest good* grapes. Vine moderately vigorous, quite hardy, productive. Deserves to be extensively cultivated as a table grape.

Anna. Seedling of Catawba, raised by Eli Hasbrouck, Newburg, N. Y., in 1852. G. W. Campbell, of Delaware, Ohio, describes it as very hardy and healthy and of a moderate growth. *Bunches* rather loose, of medium size; *berries* medium; color light amber, with small dark specks, covered with thin, white bloom. Rather pulpy. Ripens with the Catawba.—Not worth planting *here;* unhealthy and feeble.



AUTUCHON.

Autuchon. (Arnold's Hybrid No. 5.) A Seedling of Clinton, crossed with Golden Chasselas. Leaves dark green, very deep lobed and sharp pointed serratures; the unripe wood is very dark purple, nearly black. *Bunches* very long, not heavily shouldered, rather loose; *berries* medium size, round, white (green), with a moderately firm, but readily melting flesh, and an agreeable, sprightly flavor, resembling the White Chasselas. Skin thin, without astringency. Ripens with the Delaware. Mr. Sam. Miller, the originator of the Martha, bestowed the following high encomium upon the new grape in 1869:

"I have always considered Martha the best white native grape, but since seeing and tasting the Autuchon, I haul down my colors. *If* it will ripen like this in Canada, and *if* it improves by coming here like Rogers' and other Northern grapes, then it seems to me, we have all that can be desired. It alone is a treasure."

It is well that friend Miller qualified his encomium by "ifs," for the Autuchon did not come up to those expectations; it proved tender and unreliable, in the West at least; its fruit subject to rot and mildew, and notwithstanding its fine qualities, it will remain but an amateur variety and cannot be recommended for profitable culture in vineyards.

We append an illustration which gives a truthful view of the bunch as grown with us, for we have never seen any so large as represented by the cut used in our former edition, and which was obtained from the originator.

Arnold's Hybrids.* See Othello (No. 1.) Cornucopia (No. 2.) Autuchon (No. 5.) Brant (No. 8.) Canada (No. 16.)

Arrot.—(or Arcott?) (*Labr.*) Philadelphia; *bunch* and *berries* medium, white; resembling the *Cassady* in appearance, but not as good. "Sweet and good, with a thick skin, good grower, and productive."—*Husmann.*

Aughwick. (*Cord.*) Introduced by Wm. A. Fraker, Shirleysburg, Pa. *Bunches* shouldered, similar to Clinton; *berries* larger than Clinton, black, juice very dark, of spicy flavor: said to make a very dark red wine, of superior quality, and to be entirely free from rot or mildew; very hardy and healthy. We found it *not* as good as Clinton, and less productive. Should be discarded.

August Pioneer. (*Labr.*) Origin unknown; one of the coarsest of native sorts; large, black, with a firm, hard, pulpy flesh; fit only for stewing. Middle of August.—*Downing.*

Baldwin Lenoir. (*Æst.*) Originated at West Chester, Pa.; said to be a seedling of the Lenoir; *bunch* small, rather loose; *berries* small, quite dark, almost black; flesh somewhat rough, acid, brisk. Reported the richest in grape sugar of 26 varieties tested by the chemist of the Agr. Department at Washington. In foliage and habit of growth, it is much like Lincoln.

Barnes'. (*Labr.*) Originated with Parker Barnes, Boston, Mass. *Bunches* shouldered; *berries* medium, oval, black, sweet and good; nearly as early as Hartford.—*Strong.* We have not seen the grape.

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*Mr. Charles Arnold, of Paris, Canada, has been very successful in his experiments in hybridizing the native Clinton with the pollen of foreign varieties. His seedlings seem to be of decided promise. The Committee of the Paris Horticultural Society say in their report: "We find the most prominent characteristics of them as a class are: first, perfect hardiness and vigorous growth; second, early ripening both of the fruit and wood, and as yet remarkable freedom from disease, with large, handsome foliage of a very distinct character and not wooly; *bunches* large on the average; the *berries* larger than medium; skin thin, and in all the numbers we tested, free from pulp, and with a full, pleasant, sprightly flavor; our judgment being based not on a cursory examination, but from having known them for the last two seasons."

Barry. (Rogers' No. 43.) One of the most attractive of his Hybrids. *Bunch* large, rather broad and compact; *berry* medium, roundish; color black; flesh tender, of a sweet, pleasant flavor; skin thin, somewhat astringent. Vine as vigorous, healthy and hardy as any one of Rogers' Hybrids. Very productive and early, earlier than the Concord.

Baxter. (*Æst.*) *Bunch* large, and long; *berry* below medium, black; very late in ripening, hardy and productive; not fit for table, but may be valuable for wine. —*Bluffton Wine Co.*

Belvidere. (*Labr.*) Originated by Dr. Lake, of Belvidere, Ills., will probably be a valuable market variety, on account of extreme earliness, large size and fine appearance. It is an improvement in bunch and berry upon Hartford Prolific, but in quality is not much, if any better; like Hartford, it shows a tendency to fall from the bunch, especially if a little over-ripe. Being in appearance much like Hartford Prolific, only said to ripen a little earlier, a description is unnecessary. It is said to be of very vigorous growth, perfectly hardy and healthy, and very productive; but so is the Hartford also, and, we think, we have more than enough in *one* variety ot such poor quality.

Berks, or Lehigh. (*Labr.*) *Bunch* large, shouldered, compact; *berry* large, round, red, little pulp, good quality; *vine* vigorous grower, similar to Catawba, of which it is a seedling, and perhaps an improvement in size and quality; but also more subject to disease.

Bird's Egg. Probably a seedling of Catawba, somewhat similar to *Anna*. *Bunch* long, pointed; *berry* oval, whitish, with brown specks; flesh pulpy; only good, curiosity.—*Downing*.

Black Defiance. (Underhill's 8-8) A splendid, late table grape, about the best black table grape we have, with us more desirable than *Senasqua*. If we are rightly informed, it is a cross between Black St. Peters and Concord. *Bunch* and *berries* large, above Concord in size; black, with a fine bloom; three weeks later than Concord, and much better in quality.

Black Eagle. (Underhill's 8-12.) A Hybrid of Labr. and Vinifera. A new, early table grape, of best quality, not much earlier than Concord, but far superior to that variety in quality. The leaf is one of the most beautiful we know of, very firm, dark green, deeply lobed, of the shape of the foreign.

The vine is of very erect and vigorous growth, hardy and healthy, so far free from mildew and rot; *roots* straight and smooth, almost tough, with a medium fiber; canes remarkably straight and upright, with numerous, but small laterals; wood firm with medium pith; *bunch* large, moderately compact; *berries* large, oval, black, with blue bloom; flesh rich and melting, with little pulp. With Mr. *Underhill* the fruit set imperfectly, but it did not show that fault here, and must have been due to unfavorable weather during its floresence at Croton Point. We consider it one of the most promising varieties. We give on the following page a full size figure of its bunch and leaf, originally made for *Downing*.

Black Hawk. A seedling from the Concord, raised by Samuel Miller. "*Bunch* large, rather loose; *berry* large, black, round, juicy, sweet; pulp very tender; ripens full as early as the Concord, is superior in quality, and seems to be healthy and hardy."—*George Husmann*. We find it a week earlier than Concord. It has the remarkable peculiarity that its leaf is so dark a green as to appear almost black.

Bland. (*Labr. ?*) Syn. BLAND'S VIRGINIA, BLAND'S MADEIRA, BLAND'S PALE RED, POWELL. It is said to have been found on the eastern shore of Virginia, by Col. Bland, of that State, who presented scions to Mr. Bartram, the botanist, by whom it was first cultivated. *Bunches* rather long, loose, and often with small. imperfect berries; *berries* round, on long stalks, hanging rather thinly; skin thin, at first pale green, but pale red when ripe; flesh slightly pulpy, of a pleasant, sprightly delicate flavor, and with little or no musk scent, but a slight astringency; ripens late; foliage lighter green than that of Catawba, smoother and more delicate. This vine is quite difficult of propagation by cuttings. The above description of this old variety, is from *Downing's* "Fruits of America." The Bland did not succeed or ripen well in the North, and has been lost and abandoned South, but we still recognize in it the *type* of some of our present varieties.

Black King. (*Labr.*) A hardy and vigorous early grape, of medium size; sweet but foxy.—*Strong*.

Blood's Black. (*Labr.*) *Bunch* medium, compact; *berry* medium, round, black, somewhat harsh and foxy, but sweet. Very early and productive, and therefore valuable for early marketing. (Resembling *Mary Ann*, and has often been confounded with it.

Blue Dyer. (*Cord.*) *Bunch* medium; *berries* small, black, very dark juice, promises well for wine.—*Husmann*.

Blue Favorite. A Southern grape. Vine vigorous, productive; *bunch* above medium; *berries* medium, round, blue-black, sweet, vinous; much coloring matter; ripe South in September; (does not ripen well North,) said to be esteemed for wine making.—*Downing*.

Blue Imperial. (*Labr.*) Origin uncertain. Vine vigorous, free from mildew. *not* productive. *Bunches* medium, short; *berry* large, round, black; flesh with a hard acid centre or pulp; ripens with Hartford. Inferior.—*Downing*.

BLACK EAGLE. (Underhill's 8-12.)

Brant. (Arnold's Hybrid No. 8.) Seedling of Clinton crossed with Black St. Peters. The young leaves and shoots dark blood red; leaves very deeply lobed, smooth on both sides. *Bunch* and *berry* resembling the *Clinton* in appearance, but greatly superior in flavor when perfectly ripe; skin thin, free from pulp, all juice, sweet and vinous; seeds small and few (1-3): perfectly hardy; vine strong, healthy grower. A very early and desirable grape; in fact *the earliest* of all, with us, and it would be the most profitable if the birds would not destroy the bunches as soon as they ripen. For localities where grapes ripen later than with us, and where birds are less destructive, it is worthy of the attention of grape growers.

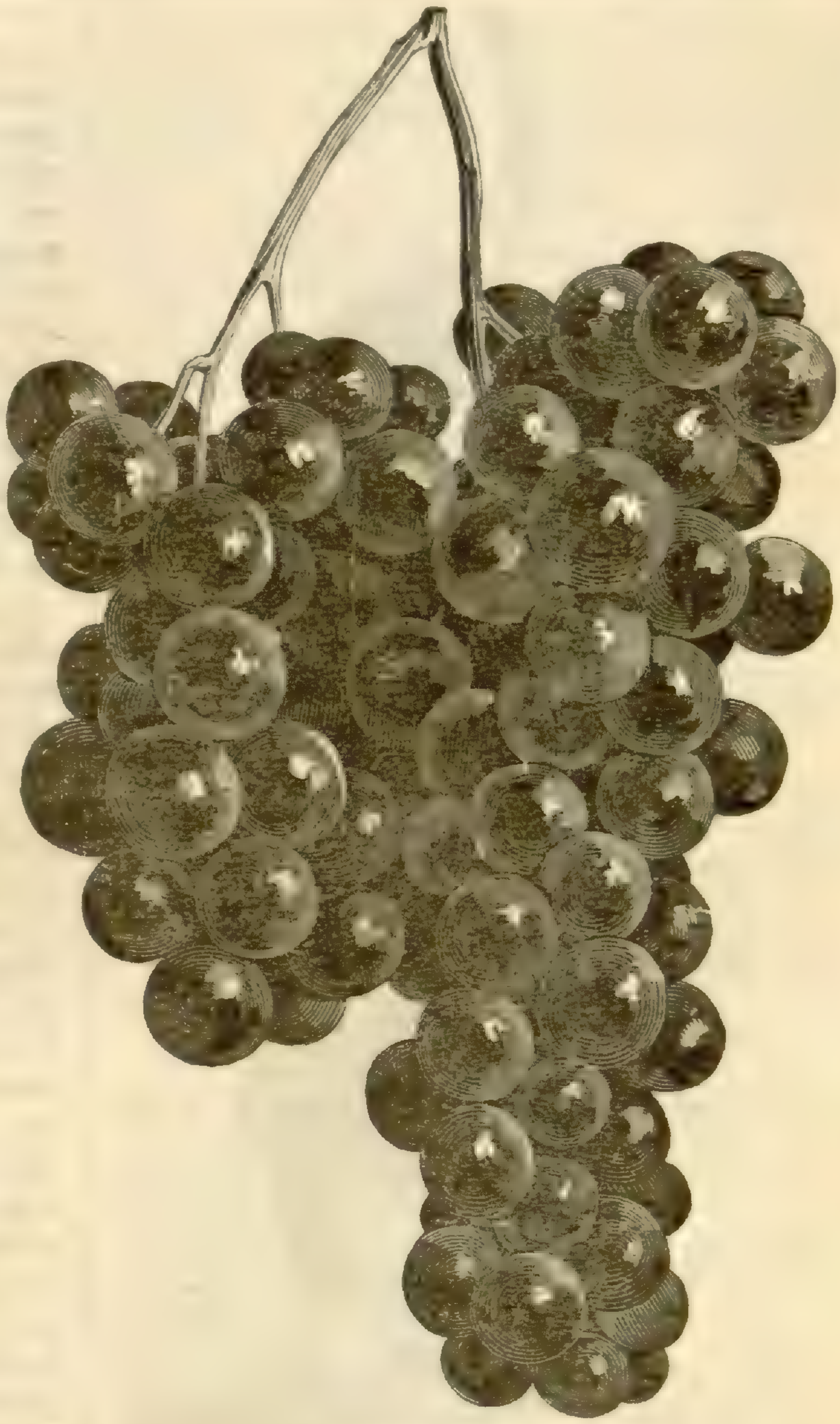
Brighton. (*Labr.*) An excellent new grape, raised by H. E. Hooker, of Rochester, N. Y. *Bunch* large and beautifully formed, compact, shouldered; *berries* above medium to large, round, of a Catawba color; quality and flavor very superior. Should the vine prove hardy, healthy and productive, it will be a valuable addition to our list of grapes. We have been favored with it by the originator for testing here, but are not allowed to disseminate the same for the present.

Bucroughs'. (*Cord.*) From Vermont. Vine allied to the Clinton. *Bunch* small; *berry* round, black, thick bloom; flesh harsh, acid, austere.—*Downing.*

Burton's Early. (*Labr.*) A large, early, poor Fox grape. Unworthy culture.—*Downing.*

Bottsi. (*Æst.*) The local name for a very remarkable grape, grown in the yard of a gentleman of that name, in Natchez, Miss. It is said to throw all other grapes ever grown there (including the Jacquez), completely in the background, and is claimed to be the true Herbemont brought some fifty years ago from S. C. It differs from our Herbemont in color, being of a light pink in the shade, a dark pink in the full sun. It may, perhaps, be the same grape of which mention is made under "Pauline." The impartial, trustworthy testimony of Mr. H. Y. Child, an amateur horticulturalist, as to its excellent quality and rapid growth, enormous fruitfulness and freedom from rot, made us procure and plant some wood of this variety, and, if it succeeds with us, we shall consider it as a valuable addition to that long neglected but most important class of American vines, and shall disseminate it among southern grape-growers.

Cambridge. (*Labr.*) A new grape, originated in the garden of Mr. Francis Houghton, Cambridge, Mass, and now introduced by Mess. Hovey & Co., of Boston, as "of the highest merit." They describe it as follows: "It is a black grape, somewhat resembling Concord, but with more oval berries. *Bunches* large and



BRANT.

shouldered; *berries* large, with a very thin skin, covered with a delicate bloom, and adhering firmly to the bunch; flesh rich, brisk and refreshing; without pulp, and more nearly approaching the Adirondac in quality than any other native grape. Period of ripening a few days before the Concord. The vine has the luxuriance of growth and handsome foliage of the Concord, while it is quite as hardy, if not hardier than that grape. It is entirely free from mildew. The Cambridge which we now describe (say Messrs. Hovey & Co.), we can quite as fully endorse as we did the Concord, just twenty years ago, (1854) and we do not doubt it will attain an equal, if not a higher rank than that variety."

Camden. (*Labr.*) *Bunch* medium; *berry* large, greenish white; flesh with a hard centre; acid; poor.

CANADA.

Canada. (Arnold's Hybrid No. 16.) Raised from seed of Clinton, crossed with pollen of Black St. Peters. Resembles the Brant (No. 3) in appearance, but has a larger berry and also ripens later. It is justly praised for its rich aromatic flavor and delightful bouquet by all who taste it. *Bunch* and *berry* above medium; color black, with a fine bloom; skin thin, free from all harshness and the acidity common to other native grapes. A moderate grower, with peculiar foliage; hardy, and matures its wood well. Will prove valuable for wine.

Canby's August. See York Madéria.

Catawba. Syn. RED MUNCY, CATAWBA TOKAY, SINGLETON. (*Labr.*) This old and well-known variety is a native of North Carolina, and has its name from the Catawba river where it was found, and introduced to notice fifty years ago, by Major John Adlum, of Georgetown, D. C. It has been for many years the standard wine grape of the country, and thousands of acres have been planted with it; but owing to its uncertainty, on account of the rot, mildew and blight, and its too late ripening in the Eastern and Northern States, (in Oct.) it is now in many sections being discarded and other more reliable kinds are planted instead. In localities where it will fully mature, and where it seems less subject to disease, there are very few better varieties.

We are now convinced that the Phylloxera is the main cause of its diseases. Wherever examined the rootlets of the Catawba were found either covered with lice, producing those now well-known nodosities, or already dead. Its roots are evidently not capable of resisting Phylloxera, and yet, unlike European varieties, they make new roots, and in favorable seasons resume their former vigor for one summer, until they are sapped again at the foundation.

In Missouri it did better in 1868 and 1874 than since 1857, owing probably to the character of the seasons, and comparative immunity from Phylloxera. *Bunch* large, moderately compact, shouldered; *berries* above medium, round, deep red, covered with lilac bloom. Skin moderately thick; flesh slightly pulpy, sweet, juicy, with a rich, vinous and somewhat musky flavor. Vine a vigorous grower; in favorable seasons and localities very productive. Clay shale soil, also gravelly or sandy soils seem best adapted. *Roots* light in comparison to the naturally strong growth of the vine, when in a perfectly healthy state, with a texture below average hardness; thick liber, and not inclined to push young fibers as rapidly as other varieties; canes straight and long, with few laterals; wood of average hardness, with a pith a little more than the average size. *Must* ranged from 86° to 91° by Œchsle's scale; by Twitchell's scale, 2.02 lbs. sugar per gallon of *must*; *acid* 12 to 13; at Hammondport, at an examination conducted under the auspices of several prominent pomologists, Oct. 12, 1870, only 7.29 per mill.

The *Catawba* has quite a number of SEEDLINGS; of *Iona* and *Diana*, its two best, and of *Aletha*, *Anna*, *Hine*, *Mottled*, *&c.*, we give descriptions in their alphabetic order; but some are actually the same as *Catawba*, and only pretended seedlings, to sell under a new name; others are so nearly identical as not to require description. To this class belong:

Fancher, claimed to be an early Catawba,

Kellers' White,
Meads' Seedling,
Merceron,
Mammoth Catawba of Hermann, very large in bunch and berry, but otherwise inferior to the parent,
Omega, exhibited in 1867 at Indiana State Fair not heard of since,
Saratoga, the same as Fancher,
Tekoma, a Missouri seedling of *Catawba*, said to be more healthy,
White Catawba, raised by Mr. John E. Mottier and abandoned by himself as inferior to its parent.

Cassady. (*Labr.*) Originated in the yard of H. P. Cassady, Philadelphia, as a chance seedling. *Bunch* medium, very compact, sometimes shouldered; *berry* medium, round, pale green, covered with white bloom; when very ripe its color changes to light yellow; skin thick and leathery, pulpy, but with a peculiar honeyed sweetness which no other grape possesses in the same degree. Ripens with the Catawba. Vine a moderate grower, a true Labrusca in habit and foliage; immensely productive—so much so that nearly every fruit bud will push several branches, with from three to five bunches each. But after thus over-bearing it becomes exhausted for several seasons, the leaves drop prematurely and the fruit will not ripen. Its *root*, like that of the Catawba, is feeble and not sufficiently resistive to Phylloxera.

This grape will flourish best on a north-eastern or northern exposure, and wherever the Catawba succeeds, we can safely recommend a trial with the Cassady. Perhaps, also, for sandy river bottoms.

Specific gravity of *must*, 89° to 96°. Wine of a beautiful golden color, of a good body and delightful aroma. The "Arrott" resembles this grape very much, but is not as good.

Catawissa, See *Creveling*.

Challenge. Supposed cross between Concord and Royal Muscadine, grown by Rev. Asher Moore, N. J. Very early; short, compact *bunches*, shouldered; large, round *berries*, pale red, with flesh slightly pulpy; very sweet and juicy. Extra hardy wood and leaf; prolific and promising; said to be an excellent dessert wine and raisin grape.

Champion, or Early Champion. A new, extra early grape, and according to Dr. Swasey's testimony, (Am. Pom. Soc. 1873, page 66,) one of the best in cultivation. It originated in New Orleans, and has been sent out for the first time in 1873 (by Mr. A. W. Roundtree). *Bunch* medium; *berry* also, black, with a handsome bloom, slightly oval in shape; thin skinned; soft and melting pulp; sweet and pleasant taste, somewhat between Ives and Concord; seeds small, 2 to 4 usually, in a berry. Ripens ten to fifteen days earlier than Hartford Prolific, and shows admirable shipping qualities. Vine a most vigorous grower; foliage heavy and healthy, resembling Ives. We shall try to obtain this new, extraordinary grape, for testing as to its adaptability to our latitude &c., and for others.

The *Tolman's* seedling is said to have alse been sent out by some dealers under the name of *Champion*, as a new and valuable variety, but if so, such abuse cannot establish a name.

Charlotte. Identical with Diana.

Charter Oak. (*Labr.*) A very large, coarse, native Fox grape, quite worthless, except for size, which makes its appearance as attractive as its musky flavor is repulsive.

Claret. (*?*) A seedling of Chas. Carpenter, Kelly Island, O. *Bunch* and *berry* medium; claret red; acid; vine vigorous; not valuable.—*Downing*.

CLARA.

Clara. Supposed to be from foreign seed. A white (or pale amber) grape, very fine for the table; somewhat like Allen's Hybrid. *Bunch* long, loose; *berry* medium round, yellowish green, transparent, without pulp, sweet and delicious; but very uncertain. Rather tender, and requires protection in the winter. Not worthy of general cultivation, and since we have so many superior varieties scarcely entitled to a place in amateur collections. Nevertheless we hear it praised in France as one of the American varieties doing remarkably well there, being vigorous and productive, apparently insect-proof in the midst of badly infected vines. (In the vineyard of M. Borty, at Roquemare.) We are inclined to believe the name is incorrect. The above figure of the Clara grape is reduced to one-fourth of natural size, (one-half diameter).

Clover Street Black. A Hybrid raised by Jacob Moore, from *Diana*, crossed by Black Hamburg. *Bunches* large, compact, shouldered; *berries* large, roundish, black, with a dark violet bloom; flesh tender, sweet; vine moderately vigorous; ripens with Concord. —*Hovey's Mag*.

Clover Street Red. Same origin as the preceding. *Bunches* larger than the Diana, loose, occasionally with a similar long stalk or shoulder appended to the top; *berries* large, roundish oval, crimson when fully ripe, with a slight Diana flavor; vine a strong grower; ripens with Diana.—*Hovey's Mag.*

Clinton. Syn. WORTHINGTON. (*Cord.*) *Strong* says that in the year 1821, Hon. Hugh White, then in Hamilton College, N. Y., planted a seedling vine in the grounds of Prof. Noyes, on College Hill, which is still remaining, and is the original Clinton. *Bunches* medium or small, compact, not shouldered; *berry* round, below medium size, black, with a blue bloom; skin thin, tough; flesh juicy, with little pulp, brisk and vinous; somewhat acid; sweeter the further south it grows; colors early, but should hang late (until after the first frost) to become thoroughly ripe. Vigorous, hardy and productive; healthy, but an exceedingly rank, straggling grower, and one of the hardest vines to keep under control; it requires a good deal of room and spur pruning on old wood to bring forth its best results. Being one of the first to bloom in spring, it suffers sometimes from late frosts.

"The best poor land grape that is known."
—*Cannon, of North Carolina.*

The leaf of the Clinton is in some seasons quite infested by the gall-louse, (the Gallœcola form of the Phylloxera) but its root enjoys a remarkable immunity from the puncture of this dreaded insect. The root-lice are found thereon but usually in small numbers, and the vine does not in the least suffer therefrom, while European vines by their side are quite destroyed.

Roots thin and wiry, but very tough, with a hard, smooth liber, rapidly forming new fibers, or spongioles, and though much infested by the Phylloxera, the insect seems to have little effect on the hard texture of the main roots. Canes rather slender, but long and rambling, with a full complement of laterals and strong tendrils. Wood rather soft and with a large pith.

Makes a fair, dark red wine, of somewhat disagreeable taste, resembling claret, which improves with age; *must*, 93° to 98° and sometimes exceeding 100°.

Columbia. This grape is said to have been found by Mr. Adlum on his farm at Georgetown, D. C. A vigorous grower, productive; *bunch* small, compact; *berry* small, black, with a thin bloom, with very little hardness or acidity in its pulp, not high flavored, but pleasant and vinous; ripe last of September.—*Downing.*

Concord. (*Labr.*) Popularly known as "the grape for the million;" originated with E. W. Bull, Concord, Massachusetts. *Bunch* large, shouldered, rather compact; *berries* large, globular, black, thickly covered with a beautiful blue bloom; skin thin, cracks easy; flesh sweet, pulpy, tender; colors about two weeks before the Catawba, but should be allowed to hang late, to develop all its excellence. *Roots* numerous, stout, above average hardness in texture, with medium liber, readily pushing new fibers under the attacks of Phylloxera. One of the best resistants among the Labrusca class, and valuable on this account as a stock to graft upon. Canes of average thickness, long, rambling, with numerous and well developed laterals. Wood of medium hardness and pith. *Vines* very strong, rampant growers; coarse, strong foliage, dark green above, rusty beneath; proved very hardy and healthy, and is immensely productive. In some localities, however, often subject to *rot* on old vines. Its beautiful appearance makes it one of the most attractive market grapes, and although its quality is not first rate, the popular taste has become so used to this variety that it sells better than superior grapes of less attractive appearance. More vines of this variety were planted during the last decade than of all other varieties together.

The Concord makes a light red wine, which is effectually becoming the laboring man's drink; can be produced cheap enough, is very palatable, and has a peculiar refreshing effect upon the system. A white wine may also be made of it by pressing the grapes without mashing them. Specific gravity of *must* about 70°.

The hardiness, productiveness and popularity of the Concord induced many attempts to raise seedlings therefrom, with a view to further improvements, but so far with no marked success. A few have been named, but remain almost unknown, except to their originators, and are probably not sufficiently distinct, nor superior to their parent.

The *Black Hawk* and *Cottage* are only earlier.

The *Main* grape was claimed to be earlier, but proved to be a Concord only under another name.

The *Modena*, raised by A. J. Caywood, of Ponghkeepsie, N. Y.

The *Paxton*, by F. F. Merceron, of Catawissa, Pa.

Worden's Seedling, by S. Worden, Minetta, N. Y.

Young America, by Sam. Miller, of Bluffton, Mo., quite resemble Concord. They are not propagated.

By these experiments it was found that the *Concord* shows a strong tendency to produce *white* seedlings, of which *Martha* was the earliest, and became one of the leading varieties.

Eva and *Macedonia*, both raised by Sam. Miller from Concord seed, were similar, but not superior to Martha, and therefore abandoned by him.

Golden Concord, by John Valle, of New Haven, Mo., is also so nearly identical with Martha that we do not think it deserves propagation as a distinct variety.

F. Muench, F. J. Langendorfer, J. Balsiger and many others have raised white Concord seedlings; some of these may prove far superior to Martha, (one especially, Balsiger's No. 32, has hardly any foxiness about it; its *must* weighing 84°, was ripe on the 15th of August in our latitude, and hanging firmly to the vine in good condition till October.) If on longer trial any of them prove so superior, then, and only then, will they be named and disseminated.

The *Lady* (see description,) is claimed to be an improvement on the Martha, and is recommended as such by good authority.

Greater improvements, however, have been achieved by hybridizing the Concord with European varieties; but while grapes of superior quality were thus produced, their hardiness, health and productiveness is generally doubted. (See "Hybrids," in Manual.)

Concord Chasselas. A Concord Hybrid from Concord seed; by Geo. W. Campbell, of Delaware, O., who describes it as follows:

"*Bunch* rather long, usually shouldered, handsomely compact, without being crowded; *berries* large, round; skin very thin but tenacious, and semi-transparent; seeds few and very small; color, when fully ripe, a rich amber with thin white bloom, almost identical in appearance with the foreign Golden Chasselas; flesh perfectly tender and melting, just enough vinous acid to prevent cloying the most delicate palate. Wholly free from any vestige of foxiness, and a grape that will satisfy the most fastidious taste, formed upon the foreign standard; ripens same time as the Concord. The vine is very vigorous in growth; large foliage, thick and abundant, resisting mildew in fully exposed locations here, as well as the Concord; and will probbably succeed in all regions where the American grape can be successfully and profitably grown.

Cottage. (*Labr.*) A seedling of the Concord raised by E. W. Bull, the originator of that variety. A strong, vigorous grower, with remarkably large and leathery leaves, and abundant, strong, branching roots; *bunch* and *berries* about the size of Concord, but of a somewhat darker shade; ripens before Concord; quality better than the parent, with less of the foxiness peculiar to the other. Promises well as a resistant to Phylloxera.

Mr. Bull in his successful efforts to improve our native grapes, began by sowing the seeds of a wild grape (V. Labrusca), from which he raised seedlings. He then sowed the seed raised from these, and obtained others, among which the Concord. He then raised 2000 seedlings before he got any that surpassed the Concord. In the fourth generation, or grandchildren of the Concord, he obtained seedlings far superior to the Concord and nearly equal to the European grape (V. Vinifera). There seems to be no reasonable doubt that, as Mr. Bull thinks, the wild grape can, in a few generations, be made equal in quality to the European vine.—*U. S. Agr. Report for* 1867.

Cowan, or McCowan. (*Cord.*) *Bunch* and *berry* medium; black, rather harsh and austere. Not desirable.—*Downing*.

Creveling. Syn. CATAWISSA, BLOOM, COLUMBIA COUNTY. (*Labr.*) Pennsylvania.—*Bunches* long, loose on young vines, but on old ones sometimes as compact as Concords; *berries* medium to large, slightly oval, black, with blue bloom; flesh tender, juicy and sweet; quality best; ripens early, a few days later than Hartford, and before Concord. Vine a fair grower, healthy and hardy; may be planted 6 by 6 feet apart, on northern and northeastern hillsides. *Roots* thick and warty, and comparatively few; texture soft, with a thick liber, forming young fibers rather slowly; canes long and rambling, slender, long jointed, and with few laterals; wood soft, of a reddish color, with a large pith.

In all these characteristics there is not a trace of the Æstivalis, for which class some would claim the Creveling.

This grape was for a time rapidly growing in favor, but has not deserved it, as it is often very unproductive, setting its fruit imperfectly. In favorable seasons and on good, well worked, tolerably rich soil, it gives a remunerative, early and delicious table fruit. No garden or amateur collection should be without it.

Mr. Husmann says it makes an exquisite claret wine, intermediate between the Concord and Nortons in body, and superior in flavor to either. *Must*, 88°.

Concord Muscat. Also grown from Concord seed, by Geo. W. Campbell, of Delaware, O., who gives the following description of it: "*Bunch* long, moderately compact, sometimes shouldered; *berries* very large, oval; skin thin, rather opaque; seeds few and small; color light, greenish white with delicate bloom; flesh entirely tender and melting, with no pulp or astringency next the seeds; flavor rich, sugary, slightly sub-acid, with the peculiar high flavor which is the distinguishing charm and excellence of the foreign Muscats and Frontignans. There are really few grapes among the most admired foreign kinds which equal this variety in pure flavor and high quality. Vine very vigorous; foliage large and moderately thick; resists mildew, except in very unfavorable seasons. In this respect it is better than Eumelan, Delaware, Clinton, or Roger's Hybrids; but not equal to Concord."

Cornucopia. (Arnold's Hybrid No. 2.) A seedling of Clinton crossed with Black St. Peters. Vine much resembling the Clinton in appearance, but superior in size of berry and bunch, and greatly superior in flavor; a healthy grape and a great bearer. The Paris Horticultural Society reported on it as follows: "This is undoubtedly one of the best grapes in the whole collection of Mr. Arnold's Hybrid grapes; a very promising grape." *Bunch* large, shouldered, very compact; *berry* above medium size, black, with a beautiful bloom, flavor excellent, very sprightly, and pleasant; skin thin; seeds large, bearing nearly the same proportion to size of berry as in Clinton. Flesh melting, with very little pulp if any: seems to burst in the mouth; all juice, with a little acid and astringency; ripens with Concord. A good market grape, and "a good keeper." Also valuable for wine, but with us *not* as good as *Canada*.

Conqueror. A seedling raised by Rev. Asher Moore, N. J. A cross between Concord and Royal Muscadine. Early; *bunches* long, loose, shouldered; *berries* medium, glossy black, with a bloom; flesh slightly pulpy, juicy, sweet. Vine a free grower, hardy, healthy and prolific.

Cuyahoga. Syn. WEMPLE. (*Labr.*) A chance seedling found and grown by —— Wemple, Collamer, Cuyahoga Co., O. Vine a strong grower, requires a

CORNUCOPIA.

warm, sandy soil and exposure to make it desirable at the North, but when well grown it is of fine quality. South it casts its foliage and is not valuable. *Bunch* medium, compact; *berry* medium, dull, greenish amber when fully ripe; flesh tender, juicy, rich vinous, sweet. Ripens with the Catawba, or a little later.

Croton. Hybrid cross between Delaware and Chasselas de Fontainbleau, originated by S. W. Underhill, of Croton Point, N. Y., bore its first fruit in 1865. In 1868 and following years, it obtained prizes at the N. Y., Pennsylvania and Massachusetts Horticultural Societies, and other grape exhibitions, attracting

THE CROTON GRAPE.

marked attention. F. R. Elliot, formerly of Cleveland, O., says: "The Croton is among the white or green sorts, what the Delaware is among the reds."

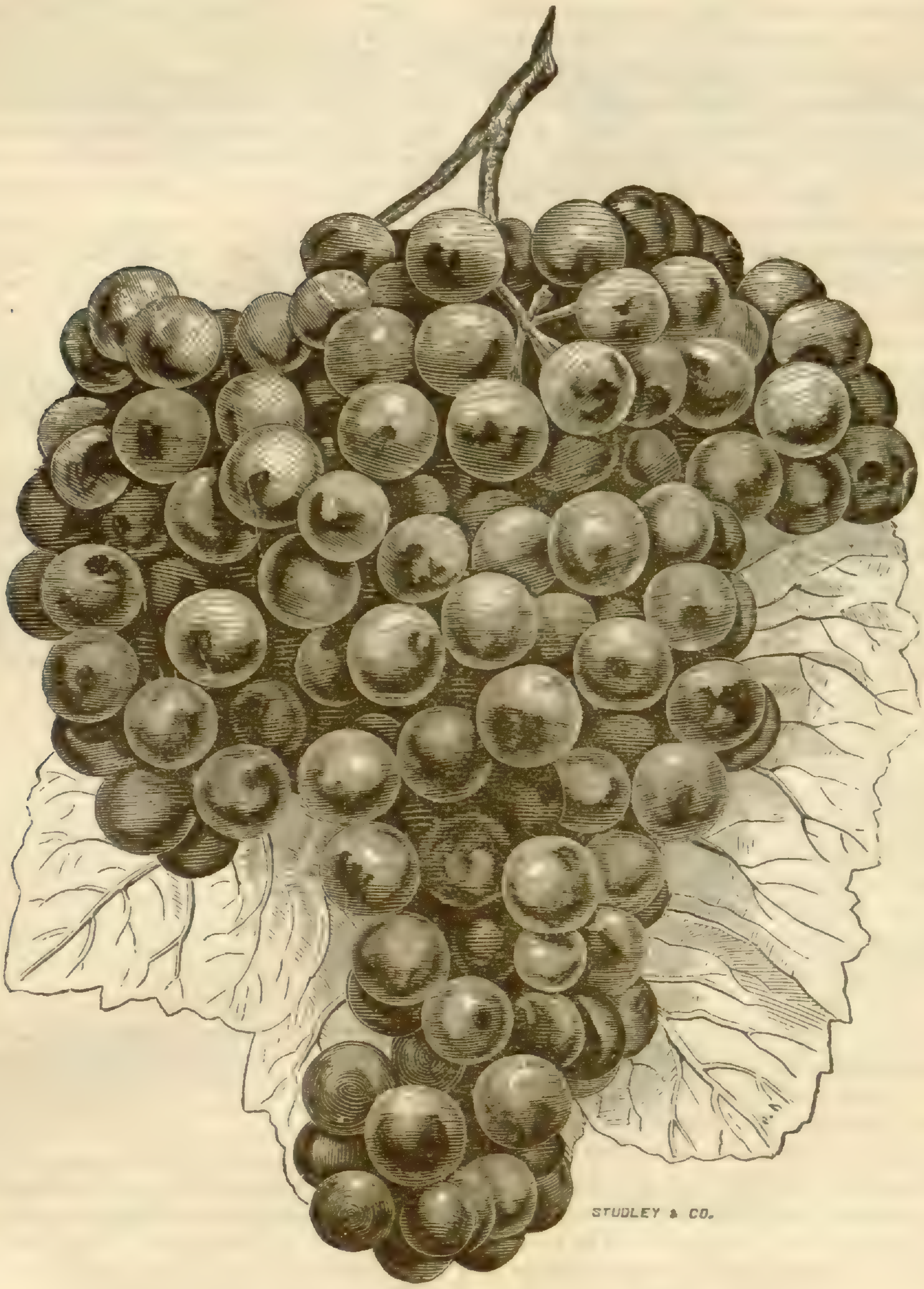
Bunch often 8 to 9 inches long, moderately compact and shouldered; the shoulder often nearly as large as the bunch, and the clusters frequently winged; *berries* of medium size, of light, yellowish green color, translucent, and remarkably delicate in appearance; flesh melting and sweet throughout; quality *best* with much of the flavor and character of the Chasselas; ripens early. Some very prominent pomologists say it is one of the best hardy grapes they have tasted and report the vine as hardy, vigorous and productive. Our own experience is, so far, not as favorable; with us it seems rather tender, a weak grower, with a tendency to mildew and rot.

We cannot recommend it for general cultivation, but only as a novel and valuable amateur fruit.

Cunningham. Syn. Long. (*Æst.*) A southern grape, belonging to the same class as the *Herbemont;* it originated in the garden of Mr. Jacob Cunningham, Prince Edward county, Va. Dr. D. N. Norton, a prominent agriculturalist, the same who first cultivated and introduced to notice our invaluable Norton's Virginia grape, made wine from the Cunningham in 1855, and furnished to the Elder Prince, of

THE CUNNINGHAM GRAPE.

Flushing, Long Island, the stock which was the base from which this grape has been disseminated, directly or indirectly. Dr. Norton pronounced the wine very similar to Murdock & Co's celebrated brand of Madeira. The Cunningham is VERY *valuable* for southern slopes, with poor, light limestone soils in *this latitude* and FURTHER SOUTH. *Bunch very* compact and heavy, medium, often, not always, shouldered; *berries* small, brownish black, juicy and vinous; vine a strong grower, HEALTHY and productive; to be so it needs, however, spur pruning on laterals and slight winter protection. *Roots* of medium thickness, inclined to be wiry, straight, tough, with a smooth, hard liber, on which the Phylloxera has but little influence, even though they may be numerous on the young spongioles; one of the *best* resistants to the insect. Canes not numerous, but very stout and vigorous, often attaining a length of 30 or 40 feet in one



THE CYNTHIANA GRAPE.

season; laterals an average complement, and well developed; wood hard with a medium sized pith, and a hard, thick outer bark, adhering closely even on the ripe wood, a characteristic common to all the Æstivalis class. Ripens its fruit *late*, and makes one of the most aromatic and delightful wines, of dark yellow color. *Must* 95° to 112°.

Cynthiana. Syn. Red River. (*Æst.*) Received by Husmann in 1858, from William R. Prince, Flushing, Long Island, New York. Origin, Arkansas, where it was, probably, found growing wild. It is a true Æstivalis in all its habits, and resembles Norton's Virginia so closely that it is impossible to distinguish the wood or leaf, although the bunch is generally somewhat more shouldered, and the berry more juicy and somewhat sweeter. *Bunch* of medium size, moderately compact, shouldered; *berry* below medium, round, black, with blue bloom,

sweet, spicy, moderately juicy. Juice very dark red, weighs very heavy on the must scale, even higher than Norton's Virginia, and makes, so far, *our best red wine*. It has as much body as Norton's Virginia, is of exquisite flavor, much more delicate than Norton's, and can safely enter the lists with the choicest Burgundy wines. The Norton's, however, seem to possess medicinal ingredients (tannin) in a higher degree. Vine vigorous and healthy, productive, as sure in its crops of well ripened fruit *here*, as any variety we know; but very difficult to propagate, as its wood is very hard with a small pith and closely adhering outer bark. Since it bore its first crop, in 1859, we have never seen a rotten berry on it. The fruit ripens some few days earlier than Norton's and Catawba. Specific gravity of *must*, from 98° to 118° according to the season. While we can confidently recommend the *true* Cynthiana as *the best grape for red wine* which we have tried, we must at the same time caution the public against spurious vines, which have been sent out under that name.

We copy the above description partly from Mr. Husmann, of whom we also obtained our original stock of this variety. We have now about 2000 vines of same in bearing. Our Cynthiana wine was awarded the First Medal of Merit at the World-Exposition, Vienna, 1873, and is gaining the "blue ribbon" at every test. The commission at the Congres de Montpellier, France, 1874, reported: "Cynthiana of Mr. Bush, a red wine of fine color, rich in body and alcohol, reminding us of old Roussillon wine." It says the same of Cynthiana exhibited by Poeschel & Scherer. Mr. Nuesch, of Dr. Lawrence's Ouachita vineyard, near Hot Spring, Ark., who got his plants from us, says: "We find the Cynthiana hardier than the Norton and a few days earlier in ripening." The juice of the Cynthiana surpasses that of the Norton's in saccharine by about 10° on Oechsle's scale, averaging about 112°. Mr. Muench writes us: "Too much cannot be said in praise of the Cynthiana; its wine, two or three years old, cannot be excelled by the best red wines of the old world." We look upon it as our BEST AND MOST VALUABLE grape for red wine, and have bestowed the best care and special attention on its propagation, so that we can now offer reliable, number one plants, with strong, insect proof, healthy roots, of this variety, to our customers, at a comparatively very moderate price.

Dana. A seedling grown by Francis Dana, of Roxbury, Mass., and described in the "Massachusetts Horticultural Transactions." *Bunch* medium, shouldered, compact, with a peculiar red stem; *berries* rather large, nearly round, *red*, with a rich, heavy bloom, so that when fully ripe they appear almost black; flesh as free from pulp as Delaware; not so sweet, but more spirited and vinous, yet not acid. Ripe last of September.

Detroit. (*Labr ?*) This variety is supposed to be a seedling of Catawba. It was found in a garden in Detroit, Mich. Not having seen the fruit we copy from description in the Horticulturalist. Vine very vigorous and hardy. Foliage resembling Catawba; wood short jointed; *bunches* large, compact; *berries* very dark, rich brown claret, with a light bloom, round and regular. Flesh with very little pulp, rich and sugary. Ripens earlier than the Catawba.

Devereux. (*Æst.*) Syn. BLACK JULY, LINCOLN, BLUE GRAPE, SHERRY, THURMOND, HART, TULEY, MCLEAN, HUSSON, (LENOIR, incorrectly). A southern grape; belongs to the same class as Herbemont and Cunningham; where this grape will succeed it is one of our very best wine grapes, producing a white wine of exquisite flavor. It is somewhat subject to mildew, very tender, and requires covering in the winter. North of Missouri it should not be tried, but here it succeeds admirably on southern slopes, in very favorable seasons, and our southern grape growers, especially, should plant some of it. *Bunch* very long, loose, shouldered; *berry* black, below medium, round; flesh juicy, without pulp, and vinous; quality best; vine a strong grower and very productive, when free from mildew.

Diana Hamburg. A *new* variety, said to be a cross between the Diana and Black Hamburg, originated by Mr. Jacob Moore, of Rochester, N. Y.; *bunches* generally large, sufficiently compact, well shouldered; *berries* above medium, slightly oval, of a rich fiery red color when fully ripe; flesh tender, of very sweet flavor, equal to some of the finer foreign sorts. Vine a weak grower, with short jointed, firm wood, very tender; leaves of medium size, crimped, and sometimes rolled in; subject to mildew. Its fruit ripens after the Concord, but before its parent the Diana. We may as well state that at least three independent parties are reputed to have made this hybrid, and there may exist several crosses of the foreign Black Hamburg on the Diana. Ours is from J. Charlton, Rochester, N. Y., but it proved *worthless*. We might as well attempt to grow the Black Hamburg in open air. Its propagation should be given up, at least we have done so.

Don Juan, one of Mr. Ricketts' seedlings, much like its parent *Iona*. Mr. F. R. Elliott says: "It is better than any known hardy grape of its color; is about the size in berry of Rogers' 15, a deeper color and a larger and better bunch; the flesh is vinous, sweet and sparkling." (See our Remarks on Rickett's Seedlings.)

Delaware. Origin unknown. It was found many years since in the garden of Paul H. Provost, Frenchtown, Hunterdon Co., N. J., who had immigrated from Switzerland, and brought with him many varieties of foreign grapes, which he cultivated in his garden. It was first known as the "Italian Wine Grape," then it was supposed to be the "Red Traminer," or a seedling from this variety. We have strong reasons to believe it a Hybrid between the *V. Labrusca* and *Vitis Vinifera*.

This variety, first brought to notice by A. Thompson, Delaware, Ohio, is considered to be one of the best, if not *the best* of all American grapes. Unfortunately it does not, from various causes, succeed well in all localities; it should be planted *here* in deep, rich soil, open and well drained, on northeast and eastern slopes, and requires good cultivation and pruning to short laterals. Its *Roots* are slender, and not inclined to branch out much; of medium toughness, with a rather soft liber. Canes proportionate, in length and thickness, with an average number of laterals. Wood hard, with a small pith. It is a slow grower. 1450 vines may well be planted to the acre, five to six feet being a sufficient distance. Some experiments have lately been made in grafting and inarching the Delaware on the Concord and Clinton stocks, which proved successful. (See "Grafting," in *Manual*.) The Delaware is exceedingly hardy, enduring the severest winters uninjured, if the vines are healthy. In some localities, as in South-west Missouri and Arkansas, it yields a sure and abundant crop, and is entirely without a rival for the production of a fine white wine; in other localities, however, it has been found subject to mildew, or leaf blight, and this tendency is greatly aggravated by allowing the vines to overbear, which the Delaware is sure to do, if permitted. It is very sensitive to Phylloxera.

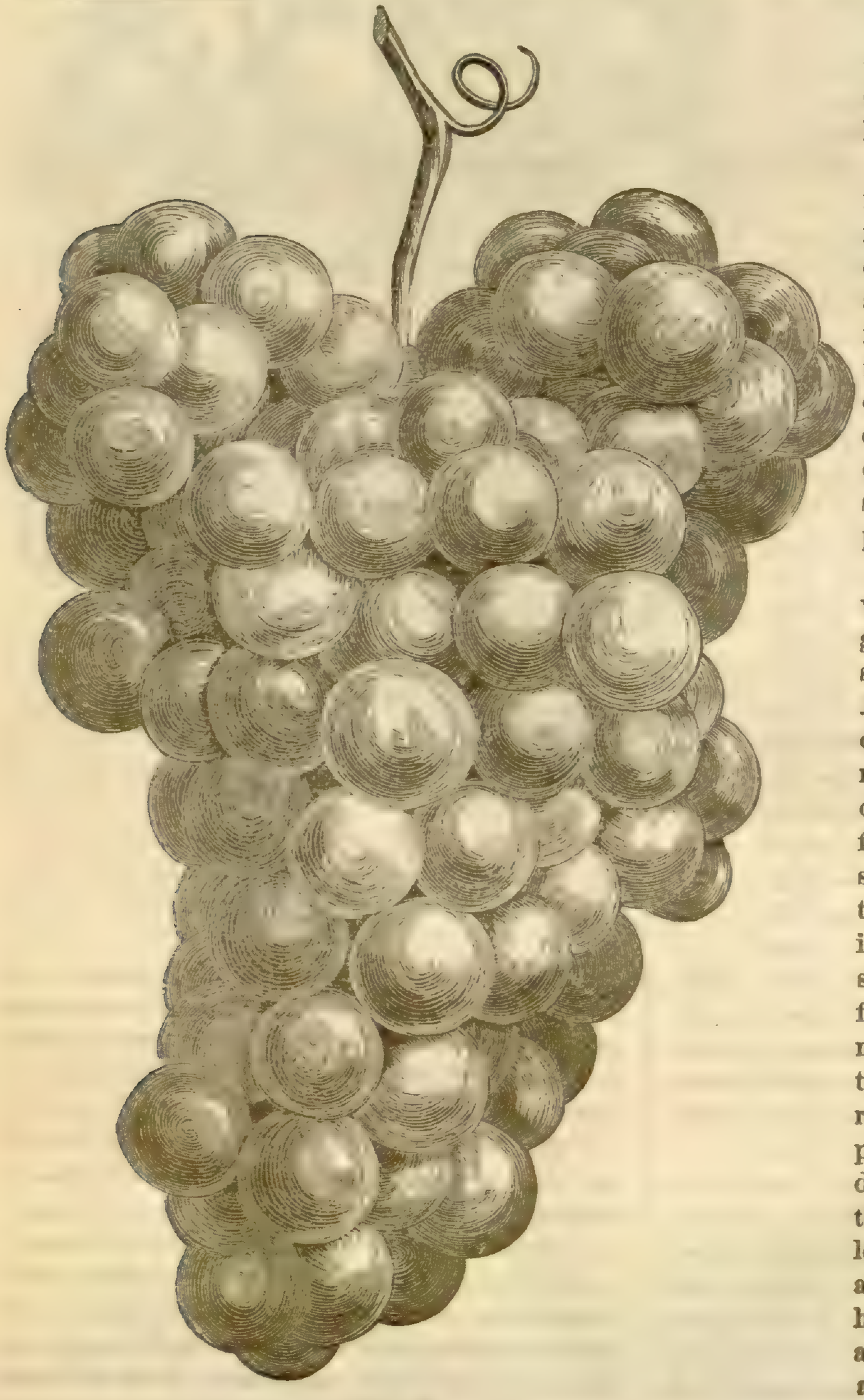
DELAWARE.

Bunch small to medium, compact; the clusters usually shouldered; *berries* below medium, round; skin thin, but tenacious; pulp sweet and tender; juice abundant, rich, vinous and sugary, sprightly and refreshing; color a beautiful light red or purplish maroon, covered with a thin whitish bloom, and very translucent. It is without harshness or acidity in its pulp, exceedingly sweet, but sprightly, vinous and aromatic. Ripens early, about eight days later than Hartford Prolific. Quality best, for the table as well as for wine. *Must* 100°—118°. Acid 5 to 6 per mill.

"The must of this grape is generally so rich, and the proportion so evenly balanced, that it will make a first class wine, of great body and fine flavor, *without* manipulation or addition." —*Husmann, U. S. Report of Agriculture*, 1867.

Seedlings from Delaware and its crosses with other varieties are but little known, though innumerable attempts have been made to raise them. The expectation to produce therefrom a

grape of superior value, larger only in size of bunch and berries, yet of the quality of the Delaware, was, and probably ever will be, doomed to disappointment. All its seedlings show more or less of the "*Fox grape*;" this fact, and other characteristics (see *Manual*—Table of Grape Seeds, &c.) convince us of its origin, *in part*, from this species; although many eminent Horticulturists and Botanists class the Delaware with *Æstivalis*, (others with Riparia). It is true that the Delaware leaf seems more closely allied to *Æst.*; its wood is harder, more difficult to propagate, and the tendrils are not continuous, (nor are they regularly intermittent); but we find a remarkable parallel case in "*Sheppard's Delaware*," raised from seed of Catawba by J. N. Sheppard, in 1853, from whom *Charles Downing* received it, with its history, and says: "*The vine and fruit are similar in all respects to Delaware.*" The "*White Delaware*," a new variety, raised by G. W. Campbell from seed of Delaware, has large, thick foliage, "*resembling Catawba more than Delaware.*" Another white Delaware seedling, raised by H. Jaeger, of Neosho, shows the same characteristics, and the fruit has a musky flavor.



DIANA.

Diana. (*Labr.*) A seedling of Catawba, raised by Mrs. Diana Crehore, Milton, Massachusetts. Mr. Fuller justly remarks:

"There is probably no one variety of grape in cultivation in regard to which there is a greater diversity of opinion, and its variableness fully warrants all that is said about it. In one section it is really excellent, while in another, perhaps near by it, it is entirely worthless. This difference is often observable in the same garden, and from no apparent cause."

The Diana seems to do best in warm, rather dry and poor soil; gravelly clay or sandy loam seems best suited to its wants. *Bunches* medium, very compact, occasionally shouldered; *berries* medium size, round, pale red, covered with a thin lilac bloom; flesh tender, with some pulp, sweet, juicy, with a musk flavor that is very strong until the fruit is fully ripe, and then often offensive to some tastes. Colors its fruit early, but does not really mature much earlier than the Catawba. Vine a vigorous grower, requiring much room and long pruning, and increases in productiveness and good quality, as the vines get age; *roots* few, but long and thick, soft in texture, and with a thick liber; canes heavy and long, with few laterals and a very large pith. It is not as productive, nor quite as large in bunch and berry as its parent,

but some think it superior in quality, and it has usually suffered less from rot. Its berries hold well, and its thick skin enables it to withstand changes of temperature better; hence the Diana improves by being left upon the vine until after pretty severe frost. As a variety for packing and keeping, it has no superior. *Eastern* grape growers claim it to be valuable also for wine. *Must* 88° to 90°; acid 12.

Downing, or Charles Downing. A Hybrid obtained by Jas. H. Ricketts, Newburgh, N. Y., from the Croton fertilized by Black Hamburgh. "*Bunches* large, sometimes shouldered; *berries* large, slightly oval, nearly black with light bloom, flesh tender, breaking somewhat like the foreign sorts; in flavor it is first rate, being sweet, with just enough sprightliness to prevent cloying the palate."—*Fuller*.

The vine is said to be a vigorous grower, with healthy foliage. Its parents forebode the reverse.

Dracut Amber. (*Labr.*) Originated by J. W. Manning, Dracut, Mass. Vine very vigorous. Regarded by us as but a slightly improved wild fox grape; very early and productive; *bunch* large and long, compact, often shouldered; *berries* large, round; skin thick, of pale red color, pulpy and foxy; too foxy for our taste, and should be discarded, when so many better varieties can be grown. Yet, even *new* varieties, quite similar, and but very little, if any better, are continually introduced. (See Wyoming Red.)

Early Hudson, (?) an early, round, black grape, of little value, except as a curiosity, inasmuch as some of the berries contain no seed.—*Downing*.

Elsinburgh. Syn. Elsinboro, Smart's Elsinborough. (*Æst.*) Supposed to have originated in Elsinburgh, Salem county, N. J. An excellent amateur grape, of fine quality; ripens early. *Bunches* medium to large, rather loose, shouldered; *berries* small, round, skin thick, black, covered with a thin blue bloom; flesh without pulp, sweet, vinous. Leaves deeply five-lobed, dark green, smooth; wood long jointed and slender. Subject to mildew.

Elizabeth, (*Labr.*) originated on the farm of Joseph Hart, near Rochester, N. Y., and described in the Rural New Yorker. *Bunches* large, compact; *berries* large, roundish oval, greenish white, with a purple tinge in the sun. Flesh rather pulpy, acid.

Elvira, a seedling from *Taylor*, raised by Jacob Rommel of Missouri, considered the most promising new white wine grape we now have. The chromo lithograph accompanying the title page was made from a photograph of a medium cluster, from the original vine, for this Catalogue. *Bunch* medium, shouldered, very compact; *berry* medium, considerably larger than Taylor, its parent, round, pale green with white bloom, sometimes tinged with red streaks when fully ripe; skin very thin, transparent; it sets so very closely and the skin is so thin as to cause some of the berries to crack; pulp sweet, very tender and juicy, fine flavor. Ripens about ten days later than Concord. Vine a most vigorous, stocky grower, eminently productive, exceedingly healthy and hardy, having stood the hard winter of 1872-3 without protection. *Roots* like those of Clinton and Taylor, promising to possess the same indemnity from Phylloxera. Canes stout and long with well developed laterals. Wood harder than the Taylor, with a medium pith. Foliage large and strong, firmer in texture than the leaves of its parent, the Taylor; somewhat rusty and woolly on the lower side, leading us to consider this variety as the offspring of an accidental intermingling of two species, the *Riparia* and *Labrusca*.

Mr. Herman Jaeger, a careful observer and very intelligent grape grower of Southwest Missouri, justly says (after a visit to Mr. Rommel's vineyard): "The Elvira has all the good qualities of its parent, the Taylor, and is entirely free from the drawback of that variety—small scattering bunches and poor bearing qualities. The original Elvira vine bears again (1874) an immense crop; four and five bunches from one bud is the general rule; they are very compact, and bunch and berry are about twice as large as the finest Taylor I ever saw. The foliage of the Elvira plainly shows its origin, though it is much larger and more beautiful than that of the Taylor. On the lower side of the leaf a slight approach to the fox grape is perceptible."

The Elvira will make an excellent white wine, resembling hock; this is not merely the expectation of Mr. Rommel, but of others, including ourselves. Mr. Jaeger, who has no pecuniary interest in this grape, wrote to S. Miller (Colm. Rural World): "In your locality and further north the Elvira, for the production of a fine hock wine, is entirely without a rival."

Being easily propagated from cuttings, the Elvira will soon be extensively tested, and, we believe it will become one of the leading, nay *the* leading white wine grape of the Middle States.

Essex, (Roger's Hybrid No. 41.) *Bunch* of medium size, compact, shouldered; *berry* very large, black, somewhat flattened, in this respect resembling the native parent; flesh tender and sweet, with a high aromatic flavor; ripens early; vine vigorous, healthy, and prolific.

EUMELAN.

Eumelan. ("Good black" grape.) (*Æst.*)* This variety was found as a chance seedling at Fishkill, N. Y., where it has been in cultivation (in the garden of Messrs. Thorne) for many years, yielding abundant crops of grapes, remarkable both for goodness and earliness. The original vines were purchased by Dr. C. W. Grant, in 1866, (now Hasbrouck & Bushnell, Iona Island,) from whom we obtained the plants of this valuable variety, probably the *best early* grape we have got. We give the description from the circular of its propagator, Dr. Grant, leaving out, however, all excessive praise, which, in our opinion, has damaged his success more than all his opponents. *Bunches* of good size, elegant form, and proper degree of compactness; *berries* large medium size, round, black, with fine bloom, adhering firmly to the bunch long after ripening; flesh tender, melting, all going to wine-like juice under slight pressure of the tongue; ripening very early (even before the Hartford Prolific) and evenly to the center. Flavor pure and refined, very sugary, rich and vinous, with a large degree of that refreshing quality that belongs distinctively to the best foreign wine grapes. *Roots* abundant, thick, spreading, and of medium toughness; liber thick but firm. Vine a strong grower, producing remarkably short-jointed wood, with numerous and strong laterals; buds large and prominent; wood hard with a small pith; leaves large, thick, dark colored, firm in texture (it strikingly resembles Elsinburg) and though subject to mildew in some localities and unfavorable seasons, we can recommend it as a very fine, hardy, healthy, early grape. The American Horticultural Annual for 1869, says of the Eumelan: This variety has been tested in several localities. It has proved with us, near New York, remarkably healthy in foliage, and has taken several premiums as *the best black grape* at various exhibitions. Then again reports came from many localities, that it has failed to meet public expectations. In our own vineyards at Bushberg, it has proved all that was claimed for it, being healthy, hardy, early, productive, and of *very* fine quality.

Perhaps with no other variety is it *so* important to set out only *good* and *strong* plants in the first place, as with this one; and we think that the great diversity of opinion now existing in regard to this grape is due to the fact that a large number of the vines of this variety sent out have been poor and feeble plants, which have never come to any good thereafter, and never will.

The Eumelan makes a superior red wine (according to Mottier, North-East, Pennsylvania, must 93°, and at the test held at Hammondsport as high as 104° with only 4 per mill. acid), and should it prove more generally successful. it will rank high among wine grapes.

We give a figure of a bunch and leaf, reduced in size, and a single berry of full natural size.

*By a mere typographical error in our first edition (1869), the Eumelan was designated as *Labr.*, and to our regret this error was ever since copied and repeated by many others who ought to know better; but while this may be a pardonable oversight in those who merely copied our descriptions, it is evidently more than an oversight in those who undertake to arrange and describe our native vines *by species* and still place Eumelan among Labrusca.

GOETHE. (Rogers' Hybrid No. 1.)

Eureka. (*Labruska*) a seedling of Isabella, originated by S. Folsom, of Attica, Wyoming Co., N. Y., similar to its parent in appearance, but claimed to be earlier, hardier, and healthier, to be of better flavor and to keep better than Isabella. Mr. Folsom has since raised eight seedlings of the Eureka, not crosses unless accidentally so, which are said to be remarkable for earliness, fewness of seeds and other good qualities.

Flora. (*Labr.?*) Origin Philadelphia, Pa. *Bunch* small, compact; *berry* small, roundish, oval, purplish-red. Flesh somewhat pulpy, acid at centre, juicy, vinous. Ripens about with Isabella. Vine hardy and productive.—*Downing*.

Flowers. Syn: BLACK MUSCADINE. (V. Vulpina or Rotundifolia.) A variety of the Scuppernong type. *Berries* large; growing in clusters of 10 to 20, black, sweet. Ripens very late; hangs upon the vine until frost. Said to make a rich, red and delicious wine. Never fails to produce a crop, and perfectly free from any kind of disease. It is much esteemed (in Georgia, Alabama and South Carolina) on account of its lateness, as it does not come in until the Scuppernong is gone. Mr. Berckmans, of Georgia, says it is not quite as good as the Scuppernong (!) and about same size.

Flower of Missouri. A new Delaware seedling, grown by Mr. M. Poeschel, Hermann, Mo. Not disseminated, and probably never will be. It possesses both the excellence and the defects of "Walter."

Framingham. Perhaps not identical with, but only a reproduction of the Hartford Prolific; at least so closely resembling it that it should not have been introduced as a new variety.

Franklin. (*Cord.*) Vine has much the habit and growth of Clinton; not as good a bearer. *Bunch* small, not very compact; *berry* small, black, juicy, quite acid, austere; unworthy.—*Downing*.

Gaertner. (Rogers' No. 14.) Not yet fruited here, and but little known. The Hon. Marshal P. Wilder, describes it as follows: *Bunch* good size; *berry* medium to large; color light brown or red; skin thin; flavor pleasant and aromatic; season rather early; vine healthy and productive.—*Grape Culturist*.

Goethe. (Rogers' Hybrid No. 1.) This very valuable variety is, perhaps, more unique and shows in its fruit more of the character of the European species than any of Mr. Rogers' other sorts, and yet its vine is one of the hardiest, healththiest, and most productive we have. Late in ripening for northern localities, it does not always mature there; but here with us it produces and perfectly ripens a large crop of beautiful clusters and berries, free from rot or imperfection of any kind, provided it has a good rich soil, and has not been permitted to overbear, which would ruin its health and productiveness for years to come, if not for ever. A sandy soil seems also favorable to its continued health, as the *roots* of the Goethe, though thick —generally of a scraggy and warty exterior— are feeble, and in clay soil they soon become a prey of the Phylloxera. The vine is a most vigorous grower, making stout and long canes, with well-developed laterals. Wood rather soft, with a moderate pith. At the Fall meeting of the Mississippi Valley Grape Growers' Association, September 9, 1868, we exhibited for the first time a few branches of the vine, each with several perfect clusters, which were much admired, and would have probably astonished even its originator, could he have seen them. The smallest of them, being a good average size, we had photographed, and an exact copy of it expressly engraved for this catalogue. The *bunches* are medium to large, not quite compact, occasionally shouldered; *berries* very large, oblong, of a yellowish-green, sometimes blotched, with a pale red toward the sun; skin thin, translucent; flesh tender and melting throughout, few seeds, sweet, vinous and juicy, with a peculiar delicious aroma; excellent for the table and for wine. Specific gravity of must 78°; altogether a MOST DESIRABLE grape for our latitude.

Golden Clinton. Syn: KING. (*Cord.*) A seedling from the Clinton closely resembling it, with this difference, that its berries are greenish-*white*, and that it is by far less productive. We doubted, for some time, that the plants we had under that name were true, and therefore did not send it out. We then obtained the true Golden Clinton from two reliable sources and fruited it, only to know that Mr. Campbell is perfectly correct in saying: "It does not sustain the character given by those who first introduced it. *Bunches* small, scanty and irregular; *berries* small and of inferior quality. Not desirable."

Graham. An accidental seedling, introduced by Wm. Graham, of Philadelphia; *bunch* of medium size, not compact; *berry* half an inch in diameter, round, purple, thickly covered with a blue bloom, contains little or no pulp, and abounds in juice of agreeable flavor. A poor grower and bearer.—*Downing*.

Hartford Prolific. (*Labr.*) The standard for earliness among grapes. Raised by Mr. Steel, of Hartford, Conn., twenty-five years ago. It is now well known, and generally planted as a very prolific early marke tvariety; ripens here early in August, about ten days in advance of the Concord; but as soon as ripe it generally drops its fruit, and is still of poor quality. The vine is very healthy and hardy, and produces immense crops. *Bunches* large, shouldered, rather compact; *berries* round, full medium, black; flesh pulpy, juicy, with a perceptible foxy flavor; *roots* very abundant, branching and fibrous. of average thickness and toughness, and

THE HERBEMONT GRAPE.

tolerably firm liber. Its good resisting power against Phylloxera is due, probably, more to its exceedingly strong root growth, than to the texture of the root itself. Canes stout, with strong crooks at the joints, laterals well developed, and considerable down on the young growth. Wood hard, with a small pith. Tolerably fair wine has been made from it, but we could not recommend it for that purpose. Only as a market grape it is considered valuable by many, on account of its earliness and great productiveness; but even as such it is inferior to several others. (Framingham and Seneca are almost identical with the Hartford.)

Herbemont. Syn: WARREN, HERBEMONT'S MADEIRA, WARRENTON, NEIL GRAPE. (*Æst.*) Origin unknown; it was propagated as early as

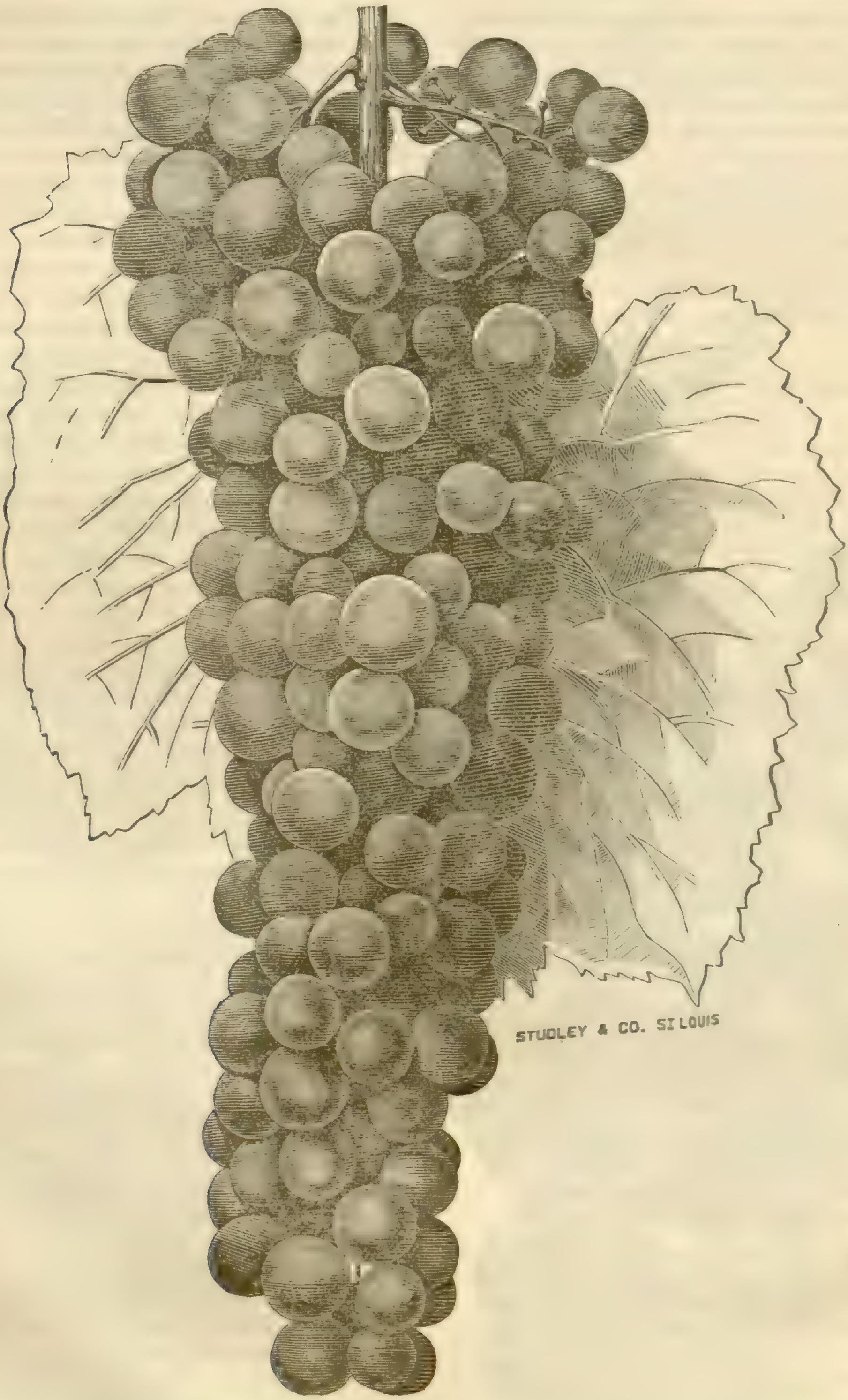
1798, from an old vine growing on the plantation of Judge Huger, Columbia, S. C. Mr. Nicholas Herbemont, an enterprising and enthusiastic cultivator of the grape, found it there, and from its vigorous growth and perfect acclimation at first correctly supposed it was a native; he was afterwards informed, in 1834, that it had been received from France, and he believed it. But the same grape was also found growing wild in Warren County, Ga., and is there known as the Warren grape. The best authorities now class it as a member of the Æstivalis family of the south—a native grape, truly called by Downing, "Bags of Wine." One of the very best and most reliable grapes for both table and wine, especially adapted for our hillsides on limestone soil. It should not be planted further north, and even here should be covered in winter. For those who have gone to this slight trouble it has nearly always produced a splendid crop, and has been so enormously productive that it richly repaid the little additional labor. To some of our Southern States this grape will be a mine of wealth. *Bunches* very large, long, shouldered and compact; *berries* small, black, with a beautiful blue bloom; skin thin, flesh sweet, without pulp, juicy and high-flavored; ripens late, a few days after Catawba. *Roots* of medium thickness, with a smooth, hard liber, resisting to the Phylloxera in France as well as here. Canes stout, heavy and long; laterals well-developed. Wood hard, with a medium-sized pith, and thick firm outer bark. Vine a very vigorous grower, with the most beautiful foliage; not subject to mildew, and but very little to rot; in rich soil it is somewhat tender, makes too much wood, and seems less productive, while in warm and rather poor limestone soil, with southern exposure, it is perfectly healthy, and enormously productive, except in very unfavorable seasons, when all half-tender varieties will fail. Mr. Werth, of Richmond, Va., says: I have found the most uniformly abundant, healthy, and thoroughly ripened crop, for successive seasons, on low, imperfectly drained, and rather compact soil. The accompanying illustration gives an idea of the beauty and richness of the bunch. Specific gravity of must about 90°. The pure juice pressed, without mashing the grapes, makes a *white* wine, resemblihg delicate Rhenish wines; if fermented on the husks about forty-eight hours, it will make a very fine pale red wine. The French wine judges at Montpelier, pronounced it "assez agréable, rappellant le gout des vins de l'est de la France."

It seems that but very few seedlings of the Herbemont have been raised; at least we know of none that were disseminated. One Herbemont seedling is mentioned by Dr. Warder, in his description of the "Longworth School of Vines." The *Pauline* (see description) may, perhaps, be a seedling of Herbemont; the *Muscogee* also; but little is known of these varieties. If WE intended to raise new seedlings (which we do *not*) we would select the Herbemont in preference to almost any other variety.

Hattie, or Hettie. There are three grapes under this name, or under conflicting descriptions. One originated with Mrs. N. R. Haskel, Monroe, Mich; described as a bright, clear red, translucent grape. The other, introduced by E. Y. Teas, of Richmond, Ind., as a large, oval, black, grape, "earlier, larger and better than Concord and Isabella." And another of unknown origin. *Bunch* small; *berry* black; flesh somewhat pulpy; a poor grower and bearer, but ripens early. All three are unknown here.

Herbert. (Rogers' No. 44.) Labrusca, impregnated by Black Hamburg. *Bunch* large, rather long and loose; *berry* large size, round, sometimes a little flattened; black; flesh very sweet and tender. Early and productive.

Hermann. This new wine grape is a seedling of Norton's Virginia, raised by Mr. F. Langendoerfer, near Hermann, Mo. The original vine had fruited in 1863 with its originator, and grafts of it fruited abundantly in 1864. It has now been tested for nearly ten years, in various places, and proved itself without a fault as to growth, foliage and fruit. On trying the must on Oechsle's scale it showed 96°, and has since varied from 94° to 105°. *Bunch* long and narrow, seldom shouldered, compact, often nine inches long; the shoulders, if there are any, having the appearance of a separate bunch; *berry* small, about same size as Norton's, round, black with blue bloom, moderately juicy, never rots or mildews, and ripens very late, a few days later than the Norton's. The juice is of a brownish yellow, making a wine of the color of brown Sherry or Madeira, of great body and of very fine flavor, resembling Madeira. Our friend Sam. Miller says: There is a peculiar fragrance about the wine of the Hermann that no other American grape possesses, and were I a teetotaler in drinking, I should like to have wine of it, just for the pleasure of smelling it. I propose for its wine the name of "Harmony,", for such it will produce. The French judges, at the Congrès de Montpellier, pronounce the Hermann "bien droit de goût, particulièrement bon and corsé." Vine a strong grower, and very productive, resembling the Norton's in



THE HERMANN GRAPE.

foliage, but the leaves are of a lighter color, the stems covered with peculiar silvery white hair-like threads, and the leaves somewhat more deeply lobed. It is, like its parent, very difficult to propagate, and will rarely grow from cuttings in the open ground. *Roots* wiry, very tough, with a smooth hard liber, defying all attacks of the Phylloxera. Canes of medium

thickness, great length and vigor, and a moderate number of laterals. The canes often branch off with a fork, having a double bud at the base, a freak of more frequent occurrence with this, than any other variety we know of. Wood very hard, with a small pith.

We have watched this grape closely, and with particular interest, and have become firmly convinced that it is an important addition to our list of *wine grapes*. If productiveness, general hardihood and health, and a superior wine can entitle a new variety to consideration, this variety certainly deserves it at the hands of our vintners. Its wine is entirely different and distinct from anything else we have, and which we hope will be the *American Madeira*, so anxiously sought by our connoisseurs. At the trial of wines, at Hermann, Mo., held on the 17th of May, 1869, the "Hermann" attracted general attention. An extra premium was awarded to it.

THE HINE GRAPE.

Let not our readers suppose that it will be a universal grape, however. For our locality and further south it will be eminently desirable; "It is a pity that it has not been more extensively planted as yet;" but much further north it will hardly attain the perfection requisite to make a superior wine, as it ripens so late. It will, we think, be found specially adapted to southern slopes and limestone soil, though it seems to have all, or even more, of the hardihood of its parent. It is a true Æstivalis in leaf and habit.

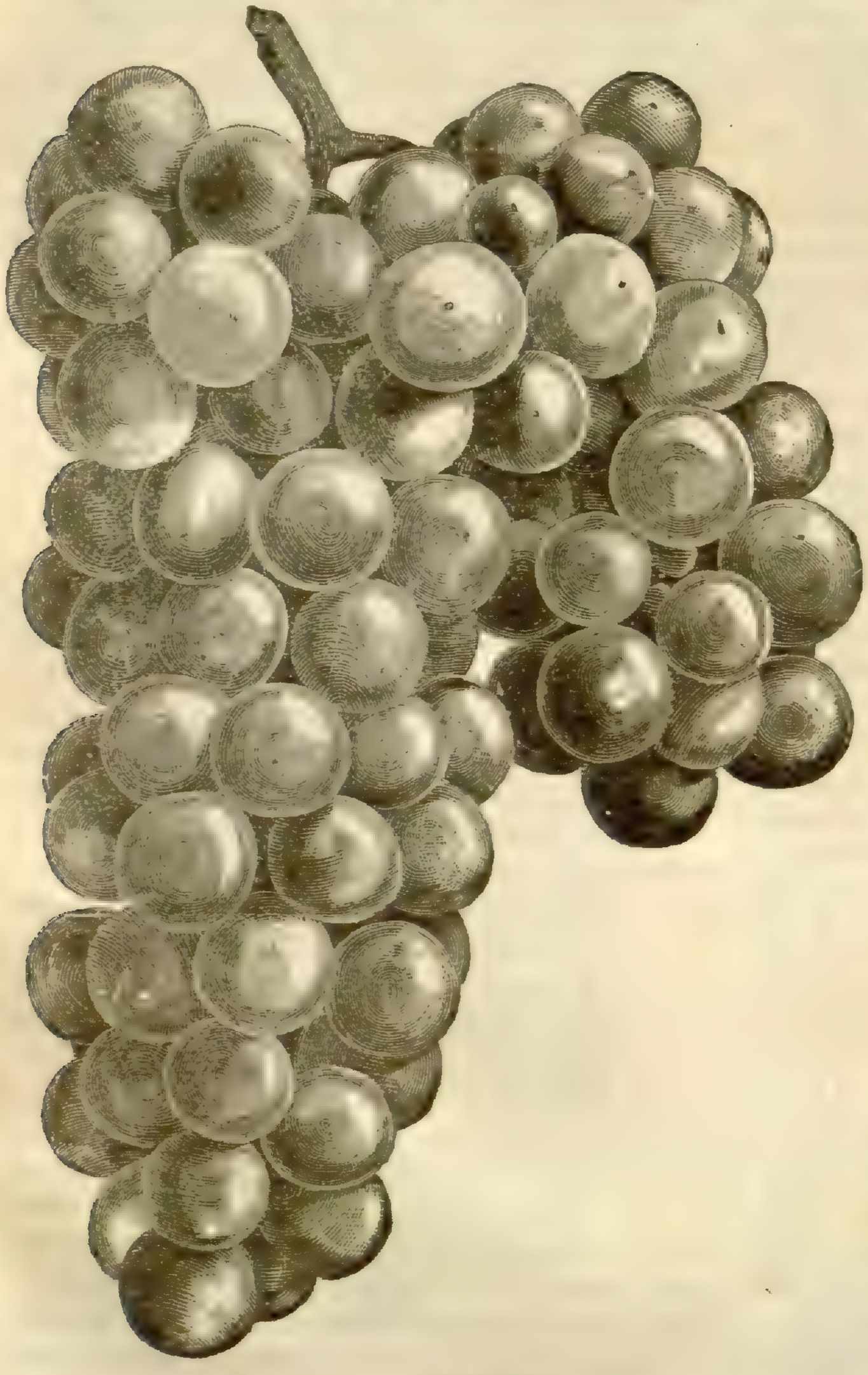
Mr. Langendorfer has lately raised some forty Hermann Seedlings, from which he selected, as the best, a *white seedling of the Hermann*, which seems very vigorous and productive, promising to be a most valuable white wine grape, and the *first* of that class (Æstivalis) with WHITE berries. The one bottle of wine made from it is as excellent in quality as the grape is remarkable for its color; some good judges who tasted the wine said: it is exceedingly smooth and fine; in bouquet plainly showing Hermann origin, only as much finer and pleasanter than Hermann, as good Cynthiana is finer and better than Norton's Virginia.

The originator does not intend to disseminate this new variety for several years, and has not decided upon a name for this grape.

Hine. (*Labr.*) A seedling of the Catawba, raised by Jason Brown (son of John Brown) at Put-in-Bay, Ohio. It makes a good-sized, compact, slightly shouldered bunch; *berry* medium, of a dark rich claret

brown, with a purplish bloom; skin of medium thickness; flesh juicy, sweet and almost without pulp; leaf large, thick and whitish underneath; canes reddish brown, short jointed; buds prominent; ripens with the Delaware, which it somewhat resembles. Justly regarded by all who have seen it as a grape of much promise. It took the first premium as the best new seedling at the Ohio State Fair (1868). We give an engraving, figured from a bunch raised by Chas. Carpenter, Kelley's Island. As this new grape has not yet been tested in different localities, we can not recommend it, except as an interesting novelty to amateurs; and its being supposed to be a cross between the Catawba and Isabella gives us but little confidence in its health.

Howell. (*Labr.*) Origin unknown; *Bunch* and *berry* medium; oval, black; skin thick; flesh with firm pulp, pleasant. Good. Middle September.—*Downing.*



IRWING.

Humboldt. (*Æst.*) A very interesting new seedling of the Louisiana, raised by Fr. Muench, described by him as of very vigorous growth, healthy and hardy, free of rot or leaf blight. *Bunch*, below medium; *berries* medium, of light *green* color, and of finest quality.

Huntingdon. (*Cord.*) A new grape of the Clinton class. *Bunch* small, compact, shouldered; *berry* small, round, black, juicy and vinous. Ripens early. Vine a vigorous grower, healthy, hardy and productive; promises well for wine.

Hyde's Eliza. See: York Madeira.

Imperial. A white seedling from Iona and Sarbelle Muscat, by Mr. Ricketts, of Newburgh, N. Y. *Bunch* large, with slight shoulder; *berry* very large, white, with considerable bloom; no pulp; no seeds (?); splendid flavor, with traces of the Iona-Muscat aroma; vine a vigorous grower, hardy; ripens about time of the Isabella. The finest white grape of Mr. Ricketts' collection, according to Mr. Williams, editor of the *Horticulturist*.

Irwing. (Underhill's 8-20.) A most showy and attractive *new* white grape, grown from Concord seed, crossed with White Frontignan, which was planted by Mr. Steph. W. Underhill, of Croton Point, New York, in the spring of 1863; fruited first in 1866. The character of the very large cluster is seen by the engraving (about one-half reduced in size). The berry is large, considerably larger than Concord, of a yellowish-white color, slightly tinged with pink, when very ripe. The vine is a healthy, vigorous grower, has large, thick foliage, with 'down' on the under side. Fruit ripens rather late, between the Isabella and Catawba, and keeps well in winter; it has a vinous flavor, and is quite fleshy when perfectly ripe. We consider this far more deserving of dissemination than his 'Croton.'

Ithaca. A new seedling raised by Dr. S. J. Parker, Ithaca, N. Y.; described by its originator as in bunch and berry larger than Walter; a pure greenish-yellow; a rose-like smell and a high, Chasselas-Mosque-like (?) flavor, and claimed to be a cross of Chasselas on Delaware, ripening before Delaware, and to be hardy, healthy and vigorous. Not disseminated. We only place it on record as one of the new varieties likely to be brought forward.

Iona. Originated by Dr. C. W. Grant, of Iona Island, near Peekskill, N. Y. It is a seedling of the Catawba, and the leaf somewhat resembles that variety. Wood soft, short-jointed, with a pith above average size; vine a strong grower; *roots* rather few, straight, of medium thickness and of no very firm texture, Canes straight, not inclined to ramble, and of medium thickness, with few laterals. Here it is subject to mildew and rot, and requires careful protection in winter.

The Iona is a fine grape for the garden, and suited only to specially sheltered and protected localities; it requires rich soil and good cultivation; in regions which are not subject to mildew (or leaf blight as it is sometimes called), and where the root louse is not abundant, to which its feeble root soon succumbs, the Iona will yield a fine crop of splendid, large and well developed .clusters. Wherever it will succeed, it is a most desirable variety, also for the vineyard, making a splendid wine. The Pleasant Valley Wine Co. use this variety largely in making their fine sparkling wines.

Bunch usually large, long and shouldered, not very compact; *berries* medium to large, slightly oval; skin thin, but tenacious; pale red, with numerous deep red veins, which become quite dark when fully ripe; fine bloom. Flesh tender, with uniform character and consistence to the center. Flavor rich, sweet, vinous; quality best;—nearly equaling the Delaware; ripens with, or a few days after Concord, and continues a long time in use. Magnificent specimens were grown in a cold-house by Mr. Saunders, at the Experimental Gardens at Washington. *Must* 88° to 92°, and some recorded as high as 101°; acid 6.6–10.

Isabella. Syn. PAIGN'S ISABELLA, WOODWARD, CHRISTIE'S IMPROVED ISABELLA, PAYNE'S EARLY, SANBORNTON (?). (*Labr.*) Probably a native of South Carolina; was brought to the North and introduced to the notice of cultivators about the year 1818 by Mrs. Isabella Gibbs, in honor of whom it was named. In the East, its great vigor, hardiness, and productiveness have caused it to be widely disseminated, but in the West it was found to ripen unevenly and very liable to mildew, rot, and leaf-blight. It has, justly we think, been entirely discarded by our grape growers, since better and more reliable varieties have taken its place. *Bunches* large, loose, shouldered; *berries* oval, large, dark purple, nearly black when fully ripe, and covered with a blue-black bloom. Flesh juicy, with a rich musky aroma; tough pulp, and a good deal of acidity. Ripens irregularly, and the leaves seem to fall just at the time they are needed to aid in ripening the fruit.

In *some* localities it is still a favorite market grape; Must at Hammondsport, 60° to 79°; acid 12½ to 6 per m.

The *Isabella* has a host of children, few of whom have survived her, it seems. Those of her seedlings which acquired some repute are described under their proper names in this Catalogue, see *Adirondac*, *Eureka*, *Hyde's Eliza*, *Israella*, *Mary Ann*, *To-Kalon*, *Union Village*.

Many of her seedlings differ so little in form, size, or quality of fruit, in growth and productiveness, (some are only different in name,) that we prefer to class them as sub-varieties. They are: *Aiken*, *Baker*, *Bogue's Eureka*, *Brown*, *Cloanthe*, *Carter* (?), *Hudson*, *Louisa*, (by Sam. Miller. It was certainly superior with him, but when the learned ones pronounced it identical, he saw no use in propagating it.) *Lee's Isabella*, *Payne's Early*, *Pioneer*, *Nonantum*, *Sanbornton*, *Trowbridge*, *Wright's Isabella*, *&c.*

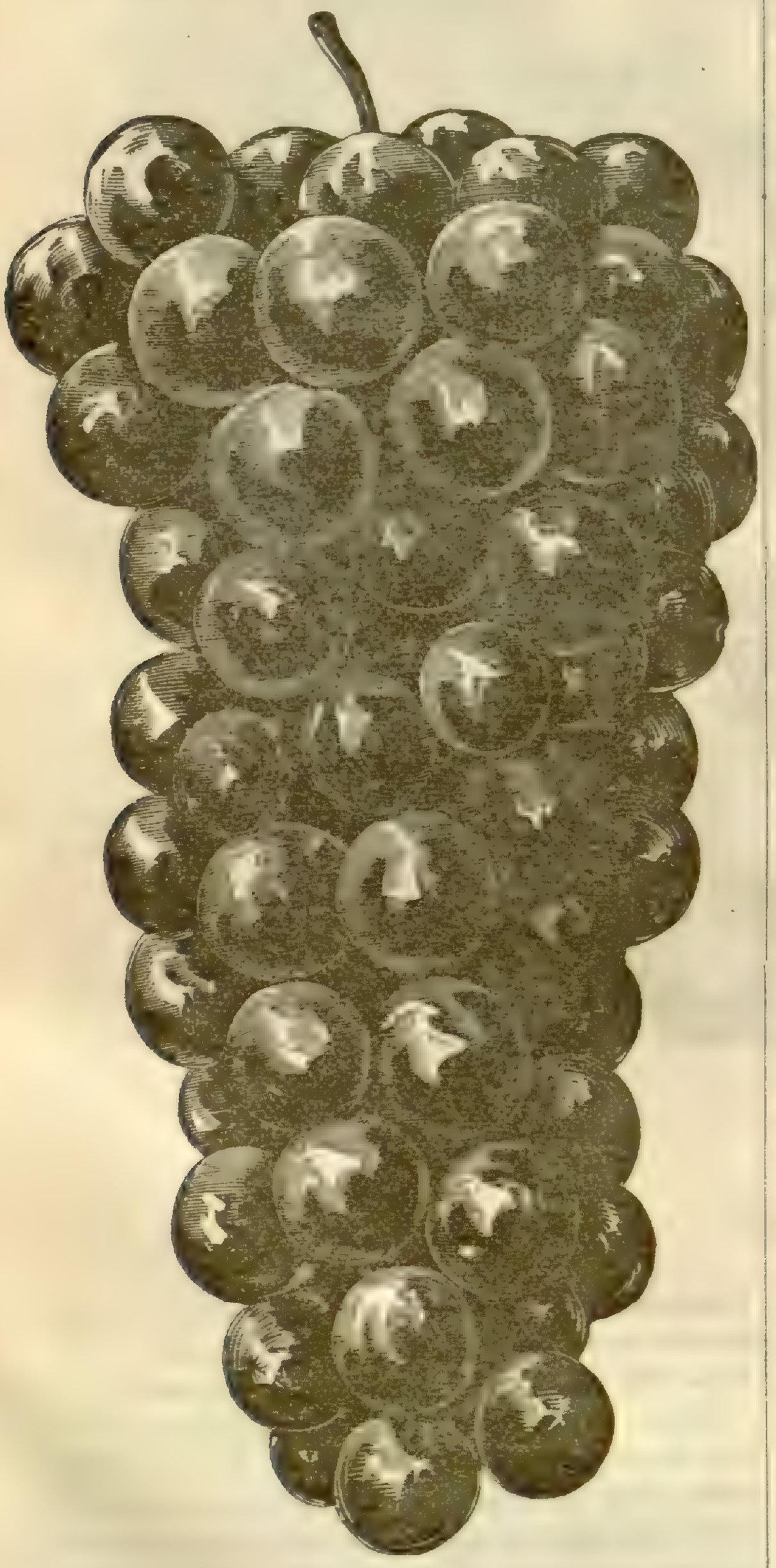
Israella. Originated with Dr. C. W. Grant, who claimed for it that it was "the earliest good grape in cultivation;" but later he himself admitted that it was not as good as his "Eumelan." With us it proved later than Hartford Prolific, but the great beauty of its clusters makes it valuable as a table grape. Vine a moderate grower; foliage subject to mildew; *bunches* large, shouldered, compact and very handsome, when well ripened; *berry* black, with beautiful bloom, rather large, slightly oval, pulpy, not above second rate in quality. Berckmans, of Augusta, Ga., however, says: "The climate of Georgia adds so much to its quality, that all who tasted it here, pronounce it the best grape in cultivation."—*Essay before the Penn. Hort. Soc.*

The Israella is probably a seedling of the Isabella, which it resembles in habit of growth and character of fruit. *Must* (said to have reached) 84°, with only 5½ acid.

Ives. Syn. IVES' SEEDLING, IVES' MADEIRA, KITTREDGE. (*Labr.*) Raised by Henry Ives, of Cincinnati, (probably from the seed of a Hartford Prolific; certainly not from a foreign grape as Mr. Ives supposed.) Colonel Waring and Dr. Kittridge were the first to make wine from it—about ten years ago—and now it is a popular red wine in Ohio. While we do *not* deem it entitled to the first prize "as the best wine-grape for the whole country," (awarded to the Ives at Cincinnati, Sept. 24th, 1868,) we do accord to it the great merit of having given a new impulse to grape growing in Ohio, at a time when the repeated failures of the Catawba Vineyards made it most desirable.

Bunches medium to large, compact, often shouldered; *berries* medium, slightly oblong, of a dark purple color; when fully ripe, quite black. Flesh sweet and juicy, but decidedly foxy, and rather pulpy. Not desirable as a table grape; but nevertheless, a popular market grape, as it bears transportation better than most other kinds.

It colors very early, but its period of ripening is later than the Concord. The vine is remarkably healthy and hardy; a strong, coarse grower, in general habit and appearance closely resembling the Hartford prolific. *Roots* abundant, thick, spreading, and of tolerably hard texture. Liber thick, but firm; pushes new spongioles rapidly and hence offers good resistance to the Phylloxera; it does not seem to be an *early* bearer, four-year old vines of this variety producing the first crop. It, however, bears profusely when older. The Ives wine has a most beautiful deep red color, but a foxy taste and odor; must 80°.



THE IVES' GRAPE.

Kalamazoo. (*Labr.*) Raised from seed of Catawba, by Mr. Dixon, an Englishman, at Steubenville, Ohio. The fruit is larger than the Catawba, and grows in bunches larger than those of that variety, and more marked in the peculiar richness of its deep blue bloom; skin thick; flesh soft, not quite tender all through; sweet, but not as rich as Catawba. According to the Am. Pomological Society Report (1871), it is said to ripen 10 days earlier; according to the Dep. of Agriculture Report, 1872 (p. 484), it is said to ripen 10 days later than the Catawba! We do not know which is correct, as we did not try this variety ourselves. The vine is said to be a vigorous grower, hardy and very productive.

Kilvington. (?) Origin unknown. *Bunch* medium, tolerably compact; *berry* small, round, dark red, with a bloom; flesh pulpy, half tender, vinous.—*Downing.*

Kingsessing. (*Labr.*) *Bunch* long, loose, shouldered; *berry* medium, round, pale red, with a bloom; flesh pulpy.—*Downing.*

Kitchen. (*Cord.*) Seedling from Franklin; *bunch* and *berry* medium, *berry* round, black; flesh acid, juicy. —*Downing.*

Labe. (?) *Bunch* rather small, short, oblong; *berries* medium, loosely set, black; flesh half tender, pulpy, sharp, sweet.—*Downing.*

"Lady." A new white grape, purchased by Mr. Geo. W. Campbell, from a Mr. Imlay, of Muskingum County, O , who has fruited it for six years, and first offered to the public in the fall of 1874. Mr. Campbell introduces it with the following encomium:

"It is a pure Concord seedling, and has all the vigor, health and hardiness of its parent. The vine, in its habit of growth, foliage, and general appearance, is scarcely distinguishable from the Concord.

"After four years careful testing and observation,* I confidently offer it as the very best white grape, for general cultivation, yet introduced. It is unquestionably an improvement on the Martha grape, being at least double in size, earlier, more productive, and at the same time free from that foxiness which renders the Martha objectionable to many. I have no hesitation in recommending it for the most extensive culture, feeling assured that it will succeed perfectly in all localities where the Concord can be grown with good success. By reason of its earlier ripening, several days before Hartford even, it will be found especially adapted to northern localities, where Concord does not always mature.† In size of *berry* it is even larger than Concord; in size of cluster, on young

* The vines endured, without injury, the severe cold of the winter of 1872-73. 32° below zero!

† In *our* latitude this *very* early ripening is not desirable, especially for wine making.

"LADY."

vines, it has been, so far, a little less; though many bunches, the past season, were fully up to the average size of Concords. In quality it is better flavored and more delicate than Concord, in its texture and general character much like it. In color, light greenish-yellow, covered with white bloom; seeds few and small; skin thin; pulp tender; flavor sweet and rich, slightly vinous, and without foxiness in taste or smell. I regard it as possessing more desirable qualities for a profitable garden and market grape, than any white grape within my knowledge."

This is certainly very strong recommendation and coming from Mr. Campbell, we receive it with great confidence. We have planted a considerable number ourselves, and hope to be able to bear testimony in the future to all he claims for it.

Lenoir. (*Æst.*) A southern grape of the Herbemont class, from Lenoir Co., N. C. *Bunch* medium, compact, shouldered; *berries* small, round, dark-bluish purple, nearly black, covered with light bloom; flesh tender, no pulp, juicy, sweet and vinous. A good variety South, but too tender and too late in ripening for the North. In favorable localities it will be found desirable for wine and table; vine a fine grower, but a tardy bearer; foliage deeply lobed; *roots* tough, resisting Phylloxera, and said to succeed and please in France. (See "Ohio.")

Lindley. (Rogers' No. 9.) This grape originated by hybridizing the wild Mammoth grape of New England with the Golden Chasselas. *Bunch* long, medium, shouldered, somewhat loose; *berries* medium to large, round; color quite peculiar, and distinct from any other variety, rather more of a *brick* red than Catawba color; flesh tender, sweet, with scarcely a trace of pulp, and of high aromatic flavor. It resembles the Grizzly Frontignan in appearance of bunch, and is by some regarded as fully equal to the Delaware in quality. *Roots* long and straight, with a smooth liber of medium firmness; canes slender for their length, with few laterals and large, prominent buds; vine of very vigorous growth, making rather long-jointed wood, medium in hardness and size of pith. The foliage when young is of a reddish color; the fruit ripens early, and drops from the bunch; it makes a splendid white wine. Specific gravity of must 80°.

"To those desiring a substitute for the Catawba, this will be an acquisition."—*Husmann.* We would recommend it as a table grape only.

Logan. (*Labr.*) A wilding of Ohio. On its introduction, supposed to be a great acquisition, and recommended by the Am. Pomological Society, as promising well; but it has sadly failed to meet public expectation, and is now more generally discarded than the Isabella, to which it was deemed preferable. *Bunches* medium, shouldered, compact; *berries* large, oval, black; flesh juicy, pulpy, insipid in flavor; vine a slender grower, early and productive.

Louisiana. Introduced here by that eminent pioneer of Western grape culture, Fred. Münch, of Missouri. He received it from Mr. Theard, of New Orleans, who asserts that it was imported from France by his father, and planted on the banks of Pontchartrain, near New Orleans, where it has for thirty years yielded abundant and luscious fruit. Mr. Münch firmly believes that it is of European origin, and belongs to the Burgundy family. Mr. Fr. Hecker is just as positive that it is European, but deems it nothing else but the Clavner grape of his native country—the Grand Duchy of Baden. Mr. Husmann, on the other hand, holds that it is a true native American, belonging to the southern division of the Æstivalis class, of which the Herbemont and Cunningham may serve as types. All agree, however, that it is a most valuable variety, very productive, yielding a most delicious fruit, and making a very fine wine.

The great vigor of its luxuriant, branching roots, well resisting Phylloxera, besides other characteristics, make us believe—the assertions of Mr. Theard to the contrary notwithstanding—that the Louisiana and Rulander are *natives*, of the Æstivalis species.

Bunch medium size, shouldered, compact, very fine; *berry* small, round, black; flesh without pulp, juicy, sweet and vinous; quality best. Vine a very good grower, *very* healthy and more or less productive, according to position and treatment; requires winter protection. *Roots* wiry and very tough, with a hard liber; canes very stout, of moderate length, short jointed, and few, large laterals; wood very hard, with a small pith, and firm outer bark.

The *Louisiana* and *Rulander* (or rather, what we call *here* Rulander,) so closely resemble each other in general appearance, growth and foliage, that we are unable to distinguish them, except by their fruit, which ripens in both varieties at the same time (rather late). Both are undoubtedly nearly related to each other; but there is a difference in the juice—the wine of these two varieties. Louisiana makes, in our estimation, the better wine of the two, in fact the finest white wine, of Hock character, that we have. Our friend Münch has succeeded in raising some seedlings of the Louisiana, which are hardy, requiring no covering in winter, and promise to be very valuable. See "Humboldt," "Schiller," "Uhland."

Lydia. Originated by Mr. Carpenter, of Kelley's Island, Lake Erie. Supposed to be an Isabella seedling. *Bunches* short, compact; *berries* large, oval, light green, with salmon tint where exposed to the sun; skin thick; pulp tender, sweet, of fine flavor, slightly vinous. In habit of growth, the vine is not unlike the Isabella, but is much less productive. A handsome grape, of good quality, but rots and mildews in unfavorable seasons; ripens a few days later than the Delaware.

Lyman. (*Cord.*). Origin unknown. A northern variety, said to have been brought from Quebec upwards of fifty years ago. Hardy and productive.

THE MARTHA GRAPE.

Bunch small, rather compact; *berry* round, medium, or below; black, covered with a thick bloom; similar in flavor to Clinton, and ripens about the same time.

Sherman and *McNeil* are varieties grown from the above, but hardly to be distinguished from it —*Downing*.

Martha. (*Labr.*) A white seedling of the Concord, raised by our friend Samuel Miller, formerly of Lebanon, Pennsylvania, now of Bluffton, Missouri. *The most popular among the* WHITE *varieties.* *Bunch* medium, smaller than the Concord, moderately compact, shouldered; *berry* medium, round, greenish white, sometimes with an amber tinge; when fully ripe pale yellow, covered with white bloom. Skin thin. Flesh very buttery, and of a remarkable sweetness unmixed with acidity and without vinous flavor; somewhat pulpy, often containing but a single seed. Odor decidedly foxy, but this character is much more apparent in the fruit than in its wine.

The vine is very healthy and hardy, resembling the Concord, but not quite as vigorous a grower, and the leaf is of somewhat lighter green. *Roots* of average texture and liber, throwing out young spongioles readily. Canes generally more upright than Concord, with less laterals and not as much inclined to ramble. Wood firm, with a medium pith. Very productive, and the berries hang well to the bunch. Ripens a few days earlier than the Concord, and will therefore suit even northern localities. Must 85° to 90°; at least 10° higher than Concord.

The wine is of a light straw color of delicate, flavor. The French commission at the Exposition of Am. Wines at Montpellier, 1874, pronounced the *Martha* as "approaching the wines of Piquepoul, produced in the Hérault."

Seedlings have been raised of late from the Martha, but are not yet disseminated; one of these, raised by F. Münch, seems to be an improvement on the parent, producing more abundantly and a somewhat larger and better fruit. (See also "*Lady*.")

Maguire is like Hartford, but more foxy.—*Strong*.

Manhattan, (*Labr.*) originated near New York. A poor bearer. *Bunches* small; *berries* medium, round, greenish *white*, with a bloom. Flesh sweet, rather pulpy.—*Downing*.

Marines' new seedlings; these are crosses between purely native varieties, claimed to be produced by a new and very simple process: diluting the pollen of the male flower with rain water and then applying it to the pistils of the variety which he selects as the female parent. Among the seedlings thus raised there are some quite peculiar and very interesting; some are of the *Æstivalis* family, but with berries of quite large size: 1. *Nerluton*, fine large bunch, berries above medium, black; leaf very large and leathery, strong. 2. *Green Castle*, same as the former, berries even larger. 3. *Luna*, white, in appearance almost like Martha; but the gain in size seems to be coupled with a loss in quality, compared to our delicious, juicy, small Æstivalis grapes. A larger number of his seedlings are of the Labrusca type, and among these his "*U. B.*" black, *Mianna* and *King William*, white, are well worthy a trial.

Mary, (?) raised by Charles Carpenter, Kelly Island. Vine hardy, strong grower. Fruit ripens too late for the North. *Bunch* medium, moderately compact; *berries* medium, round, greenish white, with a bloom. Flesh tender, slight pulp, juicy, sweet, brisk flavor.—*Downing*. Another *Mary*, an early *red* grape, is described by *Fuller*.

Marion. (*Cord.*) A new variety brought to us from Pennsylvania by that indefatigable horticulturist, Samuel Miller, who got it from Dr. C. W. Grant. It came probably from "Longworth's famous school of vines," valuable for a dark red wine. *Bunch* medium, compact; *berry* medium, but considerably larger than Clinton, round, black, juicy, sweet when fully ripe; ripens *late*—long after coloring, but hangs firmly to the bunch. Blooms early, with Clinton, which variety it resembles yet far surpasses, in our opinion; so much so that it appears almost a transition from the Riparia to Æstivalis species. Vine a very vigorous grower, rambling but not so straggling as the Clinton. Wood firm with a medium pith. Foliage large, strong and abundant; of a peculiar golden hue when young, the young branches of a beautiful red color. *Roots* wiry and firm, with a smooth, hard liber, enjoy the immunity from Phyloxera belonging to its species in the fullest degree.

Mary Ann. (*Labr.*) Raised by J. B. Garber, Columbia, Pennsylvania. *Bunch* medium, moderately compact, shouldered; *berry* medium, oval, black, pulpy, foxy, resembling the Isabella. Very early, ripening a day or two before the Hartford Prolific, and therefore valuable as an early market grape, though of an inferior quality.

Massasoit, (Roger's Hybrid No. 3). A fine, early grape for table and market. We copy the following description by Mr. Wilder, our celebrated veteran of American pomology:

Bunch rather short, medium size, shouldered; *berry* medium to large, color brownish red. Flesh tender and sweet, with a little of the native flavor when fully ripe. Season same as the Hartford Prolific. Very free from disease, and sufficiently vigorous.

MAXATAWNEY (half diameter).

Maxatawney. (*Labr.*) A chance seedling, originated in Montgomery county, Pennsylvania in 1844. First brought into notice in 1858. *Bunch* medium, long, occasionally compact, usually not shouldered; *berry* above medium, oblong, pale yellow, with slight amber tint on the sunny side. Flesh tender, not pulpy

sweet and delicious, with fine aroma, few seeds; quality best, both for table and wine. Ripens rather late for northern localities, but where it fully ripens, as here in Missouri, it is one of the finest of our native white grapes, much like the European white Chasselas. *Roots* slender, soft in texture and liber, incapable of resisting Phylloxera. Canes light and of moderate length, with average number of laterals. Wood soft with a large pith. Vine very healthy and hardy; needs no protection in winter; foliage large, deeply indented. Must 82°.

"Will make a very delicate white wine without gallizing."—*Husmann*.

Merrimack (Roger's No. 19). Regarded by some as the finest grape in the collection of Rogers' hybrids. Mr. Wilder says:

It is one of the most reliable varieties in all seasons. Vine very vigorous, free from disease. *Bunch* usually smaller than his other *black* sorts; *berry* large, sweet, tolerably rich. Season about the 20th of September (in Massachusetts.)

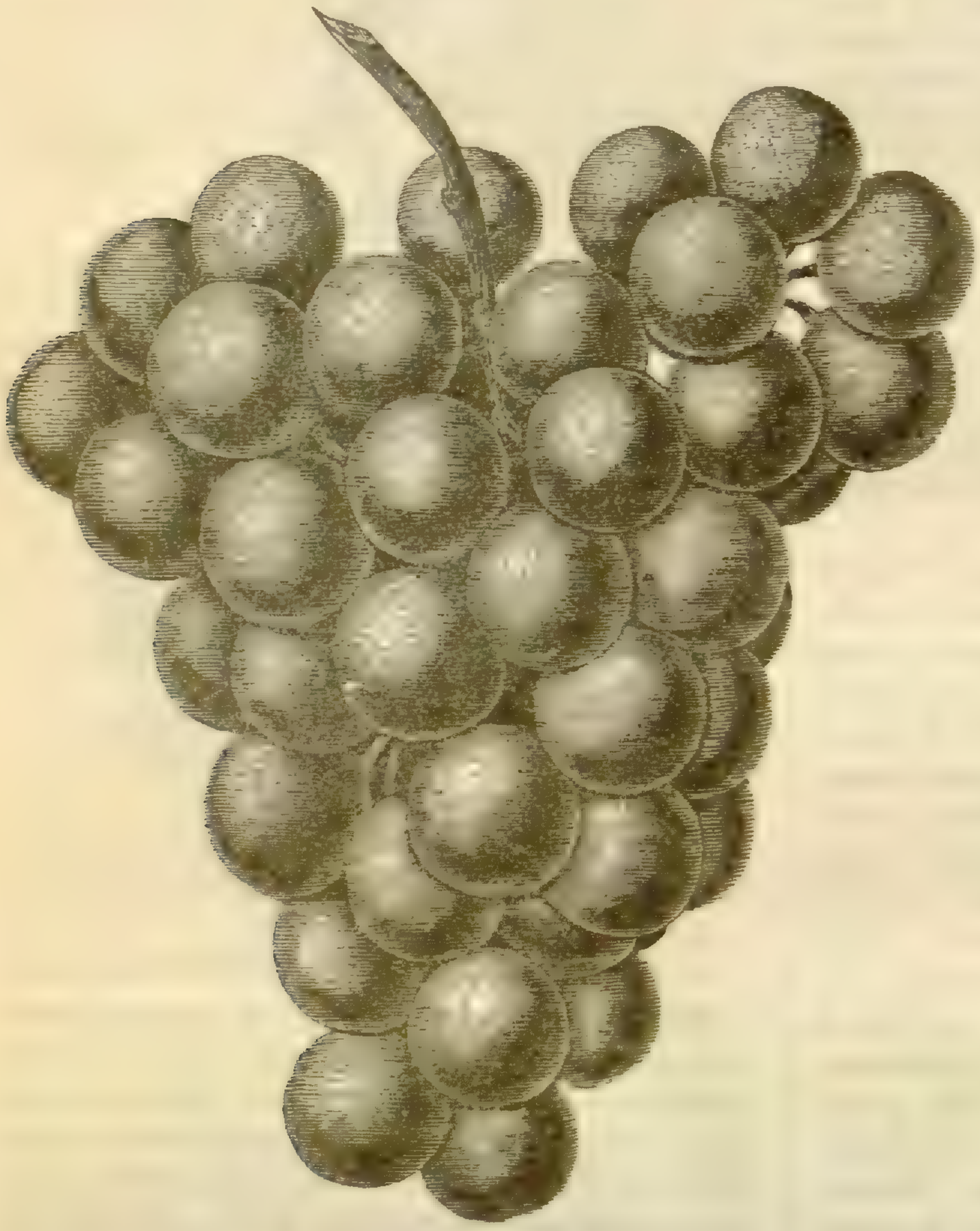
We prefer his No. 4., the "Wilder;" it is like it in quality, with by far larger and heavier bunches, and more profitable.

Miles. (*Labr.*) Origin, Westchester county, Pennsylvania. Vine a moderate grower, hardy and productive. *Bunch* small, rather compact; *berry* small, round, black. Flesh tender, slight pulp at centre; brisk, vinous, pleasant. Ripens among the *earliest*, but does not hang long. We cannot recommend it for vineyard culture as a profitable market grape, but for family use as a *good early* table grape it is valuable, especially for the North.

Miner's Seedling. (See Venango.)

Missouri. Syn: MISSOURI SEEDLING. Mentioned by *Buchanan* and *Downing*; but now unknown, even in Missouri.

Mount Lebanon. (*Labr.*) Originated by George Curtis, of the United Society of Mount Lebanon, Columbia county, N. Y.; supposed to be a cross of Spanish Amber and Isabella. *Bunch* larger than Northern Muscadine; *berry* round, reddish. Flesh pulpy, tough, though sweet, *perhaps* a little better than Northern Muscadine. *Not yet tried here.*



MOTTLED.

Mottled. Originated with Mr. Charles Carpenter, Kelly's Island. A seedling of the Catawba. Earlier in ripening and less disposed to mildew and rot than its parent. Mr. H. Lewis, of Sandusky, Ohio, says:

"This variety undoubtedly deserves more credit than it has gained, at home and abroad."

Charles Downing says:

"A profuse bearer, ripening with Delaware. It will hang a long time after ripe, and keeps unusually well."

We, in Missouri, as well as Dr. E. Van Kewren, at Hammondsport, found it a poor grower and bearer.

Bunch medium size, very compact, slightly shouldered; *berries* medium to large, round, distinctly mottled when held to the light, with different shades of red or maroon while ripening, but nearly a uniform dark Catawba color when fully ripe, with a slight bloom. Flesh sweet, juicy, vinous, of brisk, sprightly flavor, always rather pulpy and acid at the center. Skin thick. Season late, ripens with Norton's Virginia. Hangs well to the bunch, and improves by being left long on the

vines. More desirable as a wine than as a table grape. Vines healthy, hardy, and very productive on old, established vines; moderately vigorous; foliage abundant; wood short jointed. It was recorded by three competent judges, Mr. Geo. Leick being one, that its must weighed 94°, with acid 4 per mill.

Neff. (*Labr.*) Syn. KEUKA. Origin on the farm of Mr. Neff, near Keuka, on Crooked Lake, N. Y. *Bunch* medium; *berry* medium, dark copper red. Flesh pulpy and somewhat foxy. Good native, early.

Neosho. (*Æstivalis.*) Found growing wild on the farm of Mr. E. Schoenborn, near Neosho, Southwest Missouri. In 1868 Mr. Herman Jaeger sent grafts of this (and other varieties of wild summer grapes) to that pioneer of Missouri vintners, Hon. Fred. Münch, who, finding it to be of superior quality, called it the "Neosho." Cultivated since that time in Warren and Newton counties, it never failed at either place to produce large and healthy crops, and gained in favor every year. Mr. S. Miller says:

"Neosho is a treasure to the land. It is a true Æstivalis in all its habits, resembling Norton in wood and foliage, yet quite distinct. For our climate and further south it promises to be among the *white wine grapes* what the Cynthiana is among the red wine grapes."

This is the highest praise, the best prognostication that can be given. *Bunch* and *berries* are of the same size as Norton's; the bunches compact, shouldered, heart-shaped. The skin of the berries is thin, black with blue bloom, very dark, yet contains but very little coloring matter and less tannin; the pulp is meaty, very sweet and spicy, with but little acidity. Seeds rather large. The wood of the Neosho is extremely hard and tough; it will not propagate from cuttings. The vine is a most vigorous grower when once established on its own roots, or successfully grafted. Succeeds, so far, equally well on prairie, hill or bottom; requires plenty of room and prefers spur pruning on old wood. It is so hardy that it may be said to resist all the extremes of our changeable climate in Missouri. The *roots* are strong, wiry, and exempt from injury by Phylloxera. The foliage is coarse, but of beautiful color—dark and glossy green, and retains its freshness till frost sets in. The must of this remarkable new grape showed 110° on Oechsle's scale, and only 5½ mills acid on Twitchel's acidometer. Although fermented on the husk for two days, the color of the wine is a beautiful golden yellow, has an exquisite bouquet, and a most peculiar, very fine aroma, somewhat similar to Maderia wine. This variety being moreover unexcelled in fruitfulness, even in an almost poor but warm and loose soil, promises to become one of the leading varieties among American grapes, and with roots quite invulnerable by the Phylloxera may even become of great importance for France.

Great thanks are due to Mr. Jaeger and Papa Münch for having introduced this variety; but there exist only a few vines of it, and its propagation is so difficult that the high price will prevent its becoming as generally known and planted as it deserves. Nor should it be planted far north of St. Louis; it is a southern grape, ripens with Norton's Virginia, and wherever this does not ripen it is useless to try it.

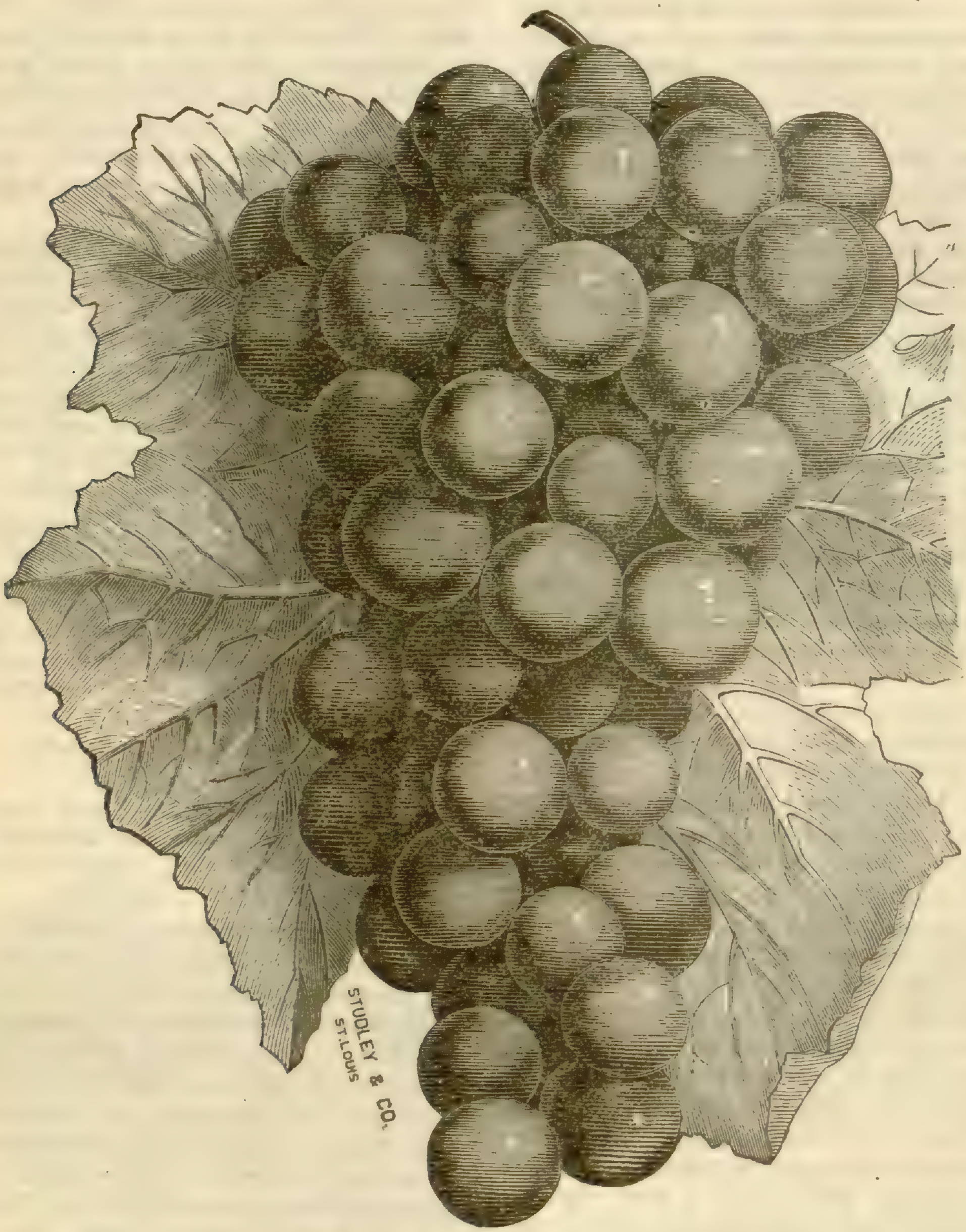
Newark. A Hybrid of Clinton and Vinifera, raised in Newark, New Jersey. Vine of vigorous growth, hardy, very productive. *Bunches* long, loose, shouldered; *berries* medium, dark, almost black, sweet, juicy and vinous, of pleasant taste; but however promising during a few years, it becomes soon diseased, its fruit subject to rot, and perishes, like its European parent; it cannot be recommended.

Newport. (*Æst.*) Said to be a seedling from and similar to Herbemont.

North America. (*Labr.*) *Bunch* small, shouldered; *berry* round, black, juicy but foxy. Ripens about with Hartford Prolific. Vine, vigorous, unproductive.

Northern Muscadine. (*Labr.*) A seedling raised by the Shakers of New Lebanon, N. Y. Opinions differ widely about its value. Papa Münch, (as we call our venerable friend, the Hon. Frederic Münch,) places it as a table grape next to the Diana and Venango, and as a wine grape far above them. *Bunch* medium, very compact, almost round; *berry* medium to large, dark amber-colored or brownish red, flesh pulpy and foxy, sweet, skin thick. Berries apt to drop from the bunch when ripe. Ripens early—about two weeks before Catawba. Vine of luxuriant growth, hardy and productive, free from rot. Its must will probably be found valuable to mix, in small proportion, with some other variety to which it would impart, we believe, a fine Muscat flavor.

North Carolina. (*Labr.*) This seedling originated with that veteran pomologist, J. B. Garber, of Columbia, Pennsylvania; belongs to the Isabella type, and is a showy market grape of fair quality. *Bunch* medium to large, occasionally shouldered, moderately compact; *berries* large, oblong, black with slight blue bloom; flesh pulpy but sweet; skin thick;



THE NORTH CAROLINA SEEDLING.

hangs well to the bunch, and will keep well and carry to market in good condition. Ripens early, coloring a few days before the Concord. Vine an enormous grower, hardy, healthy, and very productive; requires long pruning and "plenty to do." *Roots* abundant, thick, firm, with a tolerably hard liber; seems a good resistant to Phylloxera. Canes of medium thickness, long and rambling, with an average complement of laterals. Wood firm with a medium pith. The initiated can also make a good Muscatell wine of it. Must, 84°.

Norton, or **Norton's Virginia.** Originated from seed of a wild grape (from the forests in Hanover county, Virginia) in the garden of Dr. D. N. Norton, an amateur horticulturist near Richmond, Virginia, and was introduced by him to public notice about forty-five years ago. It made but little progress until about twenty-five years ago, when Mr. Heinrichs and Dr. Kehr brought it, each a few sprigs, to our Herman vine-dressers. This little insignificant looking grape, pronounced worthless by Mr. Longworth, the father of American grape cul-

ture, has, nevertheless, become *the* great and leading variety for red wine, not merely in Missouri, where its superior qualities were first appreciated and brought out in full splendor, and in its native State, but far and near, wherever grape vines are planted; and it is now so popular that it will be difficult to make our grape growers believe a variety still superior to the Norton can be found. And yet we claim this for the "*Cynthiana*."

The *bunch* of the Norton is long, compact and shouldered; *berry* small, black, with dark bluish red juice, almost without pulp when fully ripe; sweet and brisk. Ripens late in October. Vine vigorous, healthy, hardy and productive when well established, but very impatient of transplanting, and exceedingly difficult to propagate. *Roots* tough and wiry. Liber thin and hard, of great resistance to the Phylloxera. Canes vigorous, of medium thickness and good length. Wood *very* hard, with a small pith and firm outer bark. Wherever the season will admit of a thorough and perfect ripening of its fruit, the Norton will succeed in almost any soil. In rich bottoms it comes early into bearing, and is enormously productive—on high hills with rather poor soil and southern aspects it is tardy in coming into bearing, but produces there the richest wine, of great body and superior medical qualities.* It has quite a peculiar coffeine flavor which at first seems unpleasant to many, but which, like coffee, endears itself to our taste. Must, 105°—110°.

From Norton's seed two most promising *white* grapes have lately been raised, almost simultaneously: One by old Langendorfer, at Hermann, Missouri; the *other* by J. Balsiger of Highland, Illinois. These and the white *Hermann* seedling (see *Herm.*) are the first *white* pure Æstivalis we know of, and these may become as valuable for white wines as Norton's and Cynthiana are for red wines. They are *very late*, ripening even later than Norton's, and thus will not be adapted for locations north of St. Louis, but the more valuable for the South. They have not yet been named, and will not be disseminated until fully tested; and unless they prove excellent in quality, perfectly healthy and hardy and very prolific, they will not be brought out by us.

Oporto. (*Cord.*) Of the same species as the Taylor's Bullit; a true native with a foreign name. *Bunches* small, usually very imperfect; *berries* small, black, harsh and very acid; considered a very poor variety by Mr. Fuller. "Of no value, a complete humbug."—*Husmann.*

Regarded as a valuable wine grape by Gov. *R. W. Furnas* of Nebraska, who says (Report to Am. Pomological Society, 1871) "My vines (of Oporto) have never failed to give a fine crop; last year I picked *eleven hundred* good bunches fron *one* vine five years old. It is an exceedingly rampant grower, and, as a rule, the bunch not compact, bearing the fruit on until after first frosts in fall. I have found the Oporto to give a first class yield of very good wine, greatly improved by age." Governor, that is *too* good to be believed!

Onondaga. A seedling originated in Fayetteville, Onondaga county, N. Y.; a cross between the Diana and the Delaware; said to combine in some degree the flavor of both, ripening at the same time as Delaware, and to be a late keeper. Its appearance is certainly very fine, resembling Diana. Should it prove as good and healthy as its originator claims, it would indeed be a valuable acquisition, as a market grape. Not disseminated.

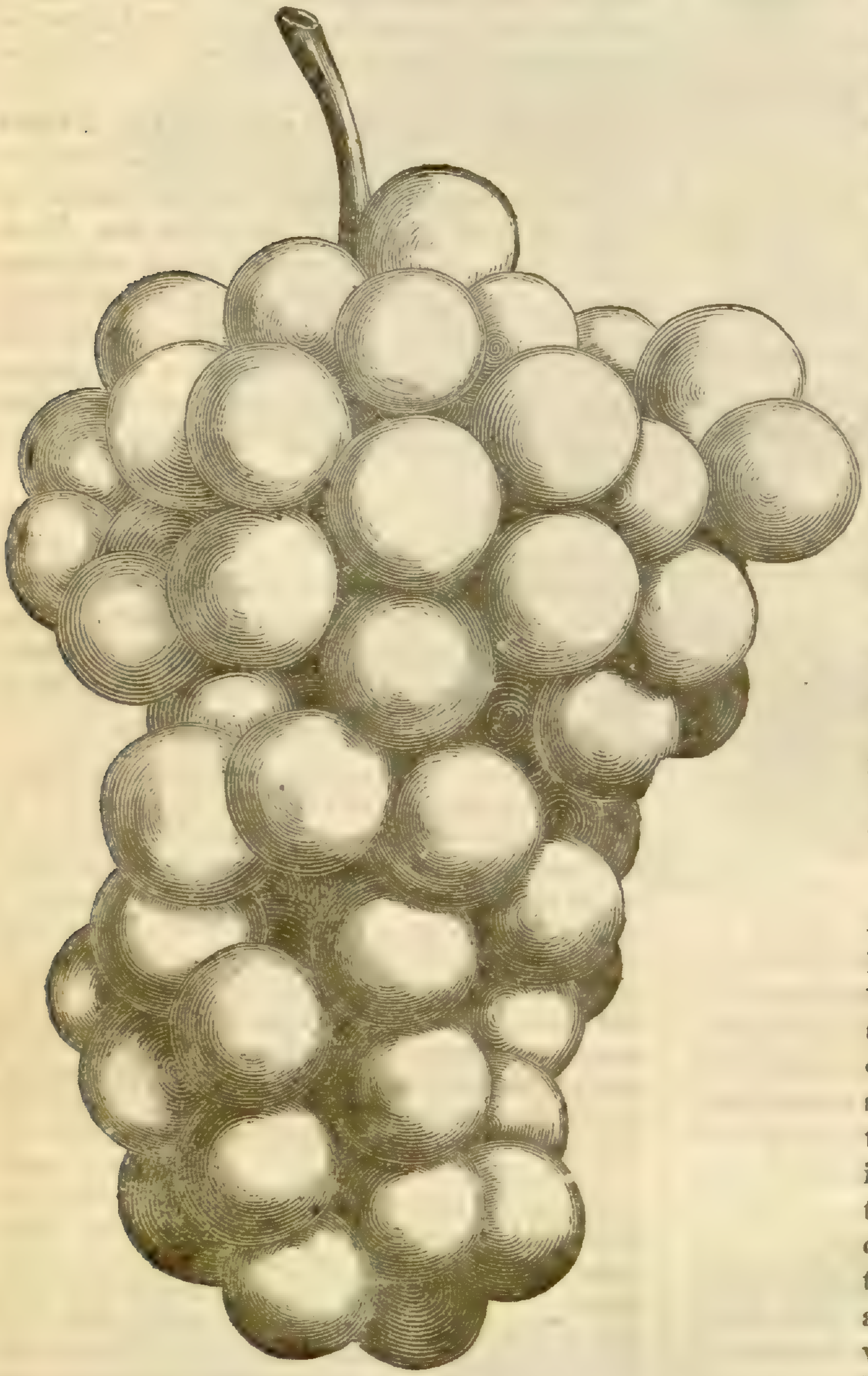
Othello, (Arnold's Hybrid No. 1.) A cross from what is called Clinton in Canada (but not the true Clinton) fertilized by the pollen of Black Hamburg. Described in the *Am. Hort. Annual* for 1868, as follows: "*Bunch* and *berry* very large, much resembling the Black Hamburg in appearance. Black with a fine bloom. Skin thin, the flesh very solid, but not pulpy; flavor pure and sprightly, but in the specimens we have seen rather acid. Ripening with the Delaware."

Our experience with it has not been as favorable as we expected. The vines proved good growers, with beautiful, large, deeply lobed, smooth foliage, but not very productive. The bunches by no means resemble the Black Hamburg in appearance; nor are they as good in quality as Mr. Arnold's other Hybrids.

Ohio. Syn. SEGAR-BOX, LONGWORTH'S OHIO, BLACK-SPANISH ALABAMA; is now understood to be identical with the "Jaques'" or "Jack," introduced and cultivated near Natchez, Mississippi, by an old Spaniard of the name of Jaques. It used to be grown in Ohio, where the stock originated from a few cuttings left in a segar box, by some unknown person, at the residence of Mr. Longworth, of Cincinnati, Ohio. This variety attracted a good deal of attention for some time on account of its large, long *bunches* (often ten to fifteen inches long, rather loose, tapering, shouldered), and its good quality; its *berries* are small, round, skin thin, purple with a blue bloom, flesh tender, melting, without pulp, brisk and vinous. The wood is strong, long jointed, lighter red than that of the Norton's Virginia, and smooth with peculiarly pointed buds. Leaves large, trilobed. At first it was also a good bearer, but soon mildew and rot affected it so badly that it was of no use, even when grown upon walls with protection. Downing (Fruit and F. trees of Am.) said "it is most likely a foreign sort, and, except in a few locations, a *sandy soil* and a mild climate, it is not

*It is the great remedy here for dysentery and diseases of the bowels.

likely to succeed." But Geo. W. Campbell, whom we have to thank for valuable information on this and many other varieties, says "I always considered the Ohio or Segar-Box, from its fruit, habit of growth and foliage, as of the same family as Herbemont, *Lenoir*, Elsinburgh, and that class of small, black, southern grapes." Friend Sam Miller, of Bluffton, Missouri, writes us: "The Segar-Box, or Longworth's Ohio, I had in the East for years, but never grew a perfect bunch. It was not hardy in vine, and the fruit both mildewed and rotted. Here it would perhaps be as free from disease as Herbemont or Cunningham, to which class it evidently belongs." When ripe it is an excellent grape. A few vines sent years ago, under the names of "Jaques" or "Ohio," to France, by P. J. Berckmans of Georgia, proved very fine and valuable, perfectly resisting Phylloxera, having remained healthy in the midst of vineyards destroyed by the root louse. This attracted great attention and gave importance to this variety. But when Mr. Berckmans was asked for more of these vines, he stated that he had none, and that their culture had been entirely abandoned. The above description by our most experienced and reliable horticulturists, makes it more than doubtful that these vines, succeeding so well in the vineyards of Mr. Borty at Roquemare, and of Mr. Laliman, near Bordeaux, were the "Ohio" or "Jaques."—After considerable research we find, moreover, that Mr. G. Onderdonk, the pioneer fruit-grower of Western Texas, describes the *Lenoir* (original stock of which he had obtained from Berckmans) as follows: "*Bunches* large, long, loose; *berries* small, black, round; no pulp; vinous and much coloring matter; leaves lobed; a fine bearer and wine grape. And we would add that the leaf and habit exactly resemble those of the *Black Spanish*. We have never planted a variety that grew off better than this variety has done during the two years we have had it in cultivation. In 1873 we gathered fruit from this variety that had been ripe seventy days on the vine." From these facts we strongly incline to believe that *this Lenoir* is the very variety our friends in France are looking for.



PERKINS.

Pauline: Syn. Burgundy of Georgia, Red Lenoir. A southern grape, of the same family as the Lenoir. Said to be superior for both wine and the table. Of little value at the North, where it does not ripen or grow well. *Bunch* large, long, tapering, shouldered; *berries* below medium, compact, pale amber or violet, with a lilac bloom; flesh brisk, vinous, sweet and aromatic. "The most delicious grape we have seen."—*Onderdonk*. Growth moderate and peculiar, comes late into bearing. Sometimes sheds a part of its leaves too early. Onderdonk believes it to be a Hybrid and not a pure Æstivalis. (See also Bottsi.)

Perkins. (*Labr.*) Origin, Mass. Resembles somewhat, in general appearance, the *Diana*; a valuable, very early market grape, as it is showy, which is more important for our markets than fine quality; besides, tastes differ, and to many tastes, its strong fox or musk flavor is not disagreeable; *bunch* medium to large, shouldered; *berries* medium, oblong, often flattened by their compactness, greenish-white at first, then of a fine, pale lilac color when fully ripe, with a thin, white bloom; flesh rather pulpy, sweet, juicy; skin thick; ripens a few

days after Hartford Prolific and before Delaware; vine a vigorous grower, healthy and productive.

Pollock. (*Labr.*) Raised by Mr. Pollock, Tremont. N. Y. *Bunches* large as Concord, compact; *berries* large, dark purple or black; flesh free of pulp, vinous, not too sweet.—*Strong.*

Putnam, or Rickett's Delaware Seedling No. 2. Cross between Delaware and Concord; very early; said to be sweet, rich and good; must stood 80° saccharometer; 4⅛ per mill. acid.

Quassaick. A Hybrid of Clinton and Muscat-Hamburg, by Mr. Rickett, of Newburgh, N. Y. It has a large *bunch*, shouldered; *berries* above medium, oval, black, with a blue bloom; flesh very sweet, juicy and rich; vine healthy and productive.—*F. R. Elliott.*

Raabe. Some say it is a Hybrid between Labrusca and Æstivalis or Vinifera, but *Strong* describes it as a cross between Elsinburg and Bland, which is probably correct. Raised by Peter Raabe, near Philadelphia; thought to be hardy, but was only moderately vigorous and proved quite unprofitable. *Bunches* small, compact, rarely shouldered; *berry* below medium size, round, dark red, thickly covered with bloom; flesh very juicy, with scarcely any pulp; flavor saccharine, with a good deal of the Catawba aroma; quality "best."—*Ad. Int. Rep.*

Raritan. Rickett's Delaware Seedling No. 1. A cross of Concord and Delaware. Plant moderately vigorous, hardy, short jointed; *bunch* medium, shouldered; *berry* medium, round, black; leaves of medium size, lobed, veined or corrugated; flesh juicy and vinous; ripens about the time of Delaware, and commences to shrivel as soon as ripe. Its originator, Mr. J. H. Rickett, of Newburg, N. Y., claims that this is a superior wine grape, its must coming up to 114° on Oechsle's scale, and 7 mill. acid by Twitchell's Acidometer. In 1871 Mr. Rickett reported to the Am. Pom. Society, 105° saccharometer; 9⅛ acid; "of course too much acid."

Rebecca. (*Labr.*) An accidental seedling, found in the garden of E. M. Peake, of Hudson, N. Y. It is one of our finest white grapes, but unfortunately very tender in winter, subject to mildew, of weak growth, deficient foliage, not productive. On south walls, in well protected situations, with dry soil and good culture, it succeeded, however, very well, and produced most delicious white grapes in some localities. *Bunches* medium, compact, not shouldered; *berries* medium, obovate; skin thin, pale green, tinged with yellow or pale amber color at full maturity, covered with a thin white bloom, considerably translucent. Flesh tender, juicy, free from pulp, sweet, with a peculiar musky and luscious aroma, distinct from any other grape; seeds small; leaves of scarcely medium size, very deeply lobed, and sharply serrated. Suited only to amateur culture.

Rentz. (*Labr.*) A Cincinnati seedling, produced by the late Sebastian Rentz, a most successful vintner. Claimed to be equal, if not superior to Ives. A large, rather coarse black grape, very vigorous and healthy in vine and foliage, and very productive. *Bunch* large, compact, often shouldered; *berry* large, round, black; flesh rather pulpy and musky, with abundant sweet juice. Ripens earlier than Ives seedling, but is not good enough to be recommended. Valuable as a stock for grafting. *Roots* thick, with a smooth, firm liber, readily pushing young rootlets, of strong resistance to Phylloxera; canes thick, but not very long nor rambling. Wood hard, with a medium pith.

Requa. (Rogers' No. 28.) A fine, table grape. Mr. Wilder, who had a better opportunity than most men, to form an accurate opinion of the merits of these Hybrids, and is without doubt the most reliable source, described it in the *Grape Culturist* as follows:

"Vine tolerably vigorous, and quite productive; *bunch* large, shouldered; *berry* medium size, roundish; skin thin; flesh tender and sweet with a trace of the native flavor; color bronzy green, assuming a dull brown red at maturity; season middle of September. A grape of fine quality, but subject to rot in unfavorable seasons."

Riesenblatt. (Giant-leaf.) A chance seedling of some Æstivalis grape that grows on Mr. M. Poeschles' vineyard at Hermann, Mo. The vine is hardy, healthy and productive; an enormous grower and a truly gigantic leaf. A small quantity of wine made from its grape by Messrs. Poeschel and Sherer has a Madeira character, resembling Hermann; color dark brown.

This variety has not been disseminated and consequently has not been tried outside of Hermann.

Rulander, or **St. Genevieve.** Syn. Amoureux, Red Elben. What we call here the Rulander is not the same vine known by that name in the neighborhood of Metz, Germany, but is claimed to be a seedling from a foreign grape brought by the early French settlers to the Western bank of the lower Mississippi (Ste. Genevieve). Mr. Husmann, however, believes it to be a native belonging to the southern division of the Æstivalis class, entirely different in foliage, wood and fruit from the Vitis Vinifera. Be this as it may, it certainly is one of our most valuable wine grapes. *Bunch* rather small, very compact, shouldered; *berry* small, dark purple, black, without pulp, juicy, sweet and delicious; not subject to rot or mildew. Vine a strong, vigorous, short jointed grower, with heart-shaped, light green, smooth

leaves, hanging on till late in November; very healthy and hardy, but requires covering in winter. It has very tough, strong *roots* with a firm, smooth liber, not subject to injury by Phylloxera; wood very hard, with a small pith and firm outer bark. And although it will not bear *big* crops, it makes up in quality as a wine grape, what it may lack in quantity. It makes an excellent pale red, or rather brownish wine, closely resembling sherry, which was repeatedly awarded a first premium, as the best light colored wine. Must 100°—110°.

Rogers' Hybrids. Those of Mr. Rogers' valuable seedlings to whom he has given names in place of numbers, by which they have hitherto been designated, have been placed, in alphabetical order, in their appropriate places;* but there are some remaining numbers yet unnamed, which deserve a name. (See also Aminia, probably No. 39.)

No. 2. One of the largest of all his Hybrids. *Bunch* and *berry* very large, dark purple, nearly black; *late* in ripening, and in flavor somewhat like the Catawba. Vine a vigorous grower and very productive.

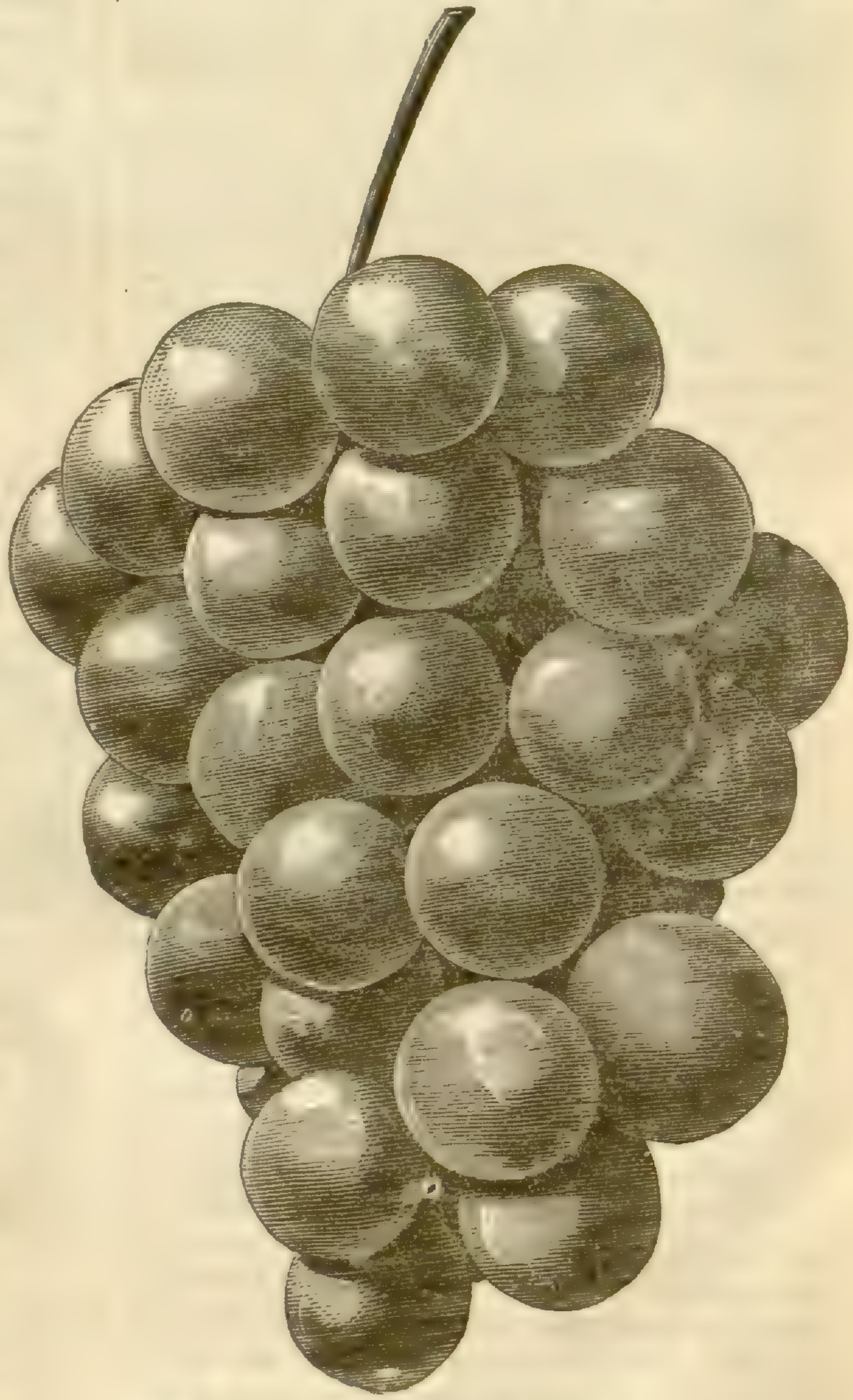
No. 5. Not yet fruited here. Mr. Geo. W. Campbell says:

"One of the finest of Rogers' Hybrids, and deserving to be better known. *Bunch* medium to large, moderately compact; *berries* large, round, red, sweet and rich; free from foxiness and in quality one of the very best. Vine perfectly hardy and healthy, but not as strong a grower as some others."

No. 8. Considered by Mr. Husmann as one of the *best*, and valuable for wine making purposes, he describes it as follows: "*Bunch* and *berry* large; color pale red, but the fully matured berries a deep coppery red, with fine light gray bloom; flesh sweet, juicy, with pleasant flavor, and almost entirely free from pulp. Skin about the same thickness as Catawba. Vine a strong, vigorous grower, with broad, thick and coarse foliage. Hardy and productive." We do not think so much of these Hybrids, and we fear that their ROOTS are not sufficiently resistive to Phylloxera.

*No. 1. Goethe
No. 3. Massasoit.
No. 4. Wilder.
No. 9. Lindley.
No. 14. Gaertner.
No. 15. Agawam.
No. 19. Merrimac.
No. 28. Requa.
No. 41. Essex.
No. 43. Barry.
No. 44. Herbert.
No. 53. Salem.

Salem (Rogers' No. 53.) Like Agawam (No. 15) and Wilder (No. 4), this is a Hybrid between a native (Wild Mammoth), the female, and the Black Hamburg, the male parent. *Bunch* large and compact, broad, shouldered; *berry* large as Hamburg, three-fourths of an inch in diameter, of a light chestnut or catawba color; flesh tolerably tender, sweet, with rich, aromatic flavor; a little foxiness to the smell which is not perceptible to the taste; considered in quality one of the best; skin rather thick; seeds large; ripens as early as Concord; it also



ROGERS' HYBRID NO. 8.

keeps well. Vine very vigorous, healthy; foliage large, strong and abundant; wood of a lighter color than most of the Rogers grapes. The *roots* are of medium thickness, branching, with smooth, firm liber, and have more of the native character than most other Hybrids; they

seem to resist the Phylloxera as well as most Labrusca varieties; the Salem can be propagated from cuttings with remarkable ease, and its vigor of growth in the shoots has hardly a parallel among Hybrids. Wood rather firm with a moderate pith.

Ricketts' Seedling Grapes. Mr. J. H. Ricketts of Newburgh, N. Y., has worked for the last eight years or more, with an energetic desire to produce by hybridization, some better grapes for out-door or vineyard culture in this country, than any we have, and his collection of new seedlings, (now 75 in number) is really remarkable both for great variety and superior quality, but as he does not grow them on a large scale himself, nor put them on the market that others may do so, their hardiness and productiveness has not been tested; to judge by what we have heard from the few who were favored with some grafts, we fear they are *not* hardy, and are *very much subject to rot*. But this may apply only to his hybrids, congenerous with foreign varieties, while some of his crosses between purely native varieties *may be* quite hardy and healthy. We certainly wish it, for we can testify to the great excellence in quality of those of Mr. Ricketts' seedlings which we were allowed to taste at the meeting of the Am. Pomological Society at Boston (Sept. 1873). Most of them are designated only by numbers; (Clinton No. 3 and 24; Nos. 32 and 157 similar to white Chasselas; Nos. 71 A and 87 B, white, with a delicate Muscat flavor; No. 48, seedling from Delaware, and No. 12 B, we regarded as the most promising, and we offered $100 for two young vines of each of them, but Mr. Ricketts desires to sell the Stock.* Those which have been named, so far, will be found in this catalogue, with such descriptive notes as we could obtain.

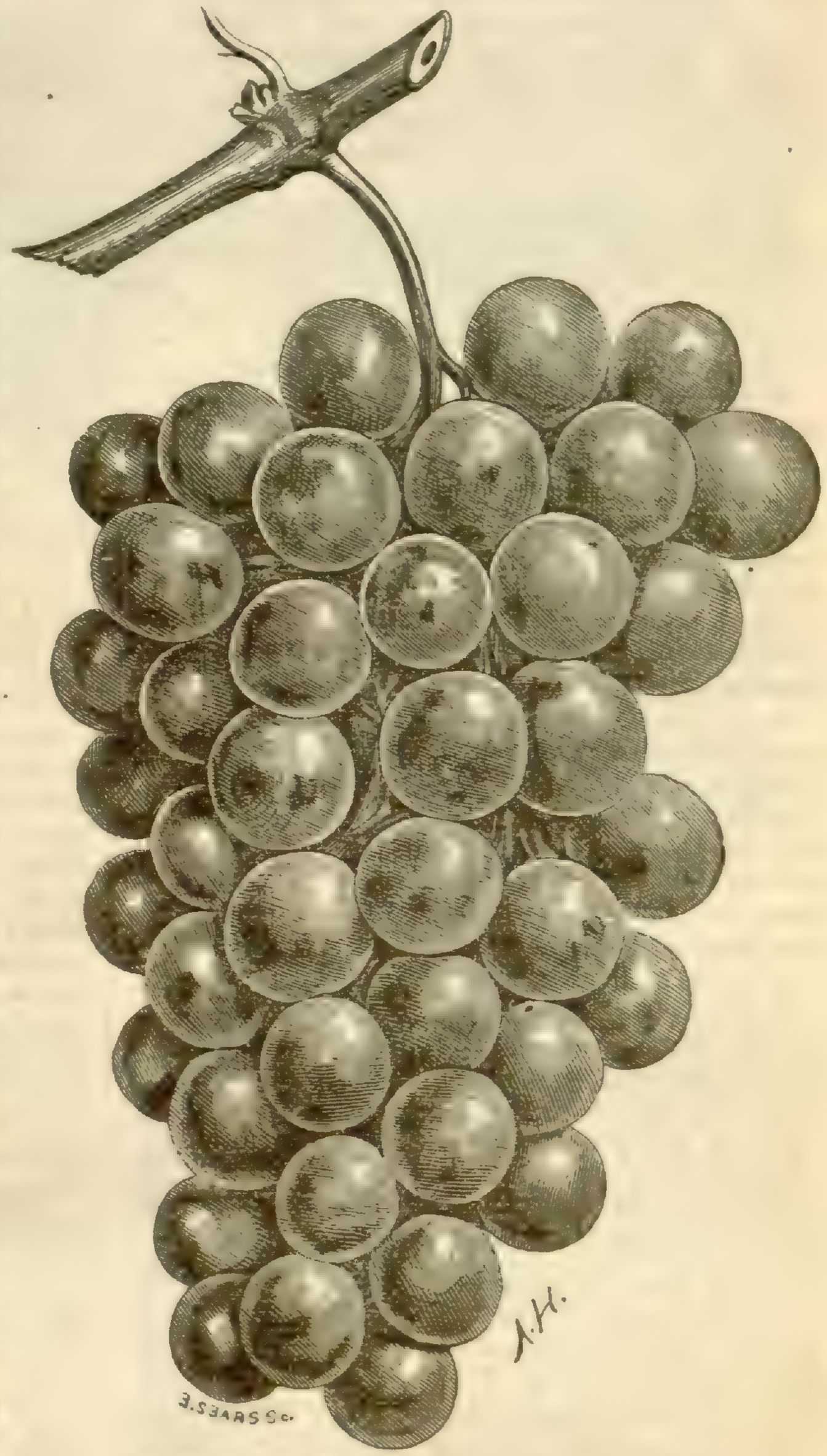
Secretary. Obtained by J. H. Ricketts, Newburgh, N. Y., by crossing the Clinton with Muscat Hamburgh. Vine vigorous, hardy. *Bunch* large, moderately compact, shouldered, with a large, black, roundish oval *berry*. Its peduncle red at the base when drawn from the berry. Flesh juicy, sweet, meaty, slightly vinous. Must 93° saccharometer; 7¼ per mill. acid. Foliage like Clinton but thicker, and about the same size.

Schiller. One of Muench's seedlings o[f] the Louisiana. Vine perfectly hardy, a vigorous grower, healthy and, so far, more productive than his other seedlings. Fruit of a purplish blue color, but light juice; otherwise quite similar to his Humboldt.

Seneca. Very similar to (if not identical with) Hartford. First exhibited at Hammondsport, N. Y., in October, 1867, by Mr. S. Simpson, of Geneva, N. Y. Highly recommended by T. S. Hubbard, N. Y., not known in the West.

*We are just notified (February, 1875), that Messrs. Hance & Sons have purchased the entire stock of several of these new seedling grapes for propagation.

St. Catherine. (*Labr.*) Raised by James W. Clark, Framingham, Mass. *Bunch* large, rather compact *berries* large, chocolate color, rather sweet, tough, foxy. Not of much value.—*Downing.*



THE SECRETARY GRAPE.

Scuppernong. Synonym: YELLOW MUSCADINE, WHITE MUSCADINE,* BULL, BULLACE, or BULLET, ROANOKE, (*Vitis Vulpina* or *V. Rotundifolia*). This is purely and exclusively a southern grape; in South Carolina, Florida, Georgia, Alabama, Mississippi and in parts of Virginia, North Carolina, Tennessee and Ar-

*The black or purple grapes of this class are often *incorrectly* called "Black Scuppernong." Southern horticulturists designate them by different names: Flowers, Mish, Thomas, etc.

kansas—it is quite a favorite, producing annually large and sure crops, requiring scarcely any care or labor. It is entirely exempt from mildew, rot or any of the diseases so disastrous to the northern species, entirely exempt also from Phylloxera; but it cannot be grown north of the Carolinas, Tennessee and Arkansas, nor even in Texas. Mr. Onderdonk, whose nurseries are farther south than any other in the United States, says about the Scuppernong grapes: "We have repeatedly tried it, and as frequently failed."—*We* would not attempt to grow it, even if we could, as we can raise by far superior grapes.

We are aware that Southerners are very sensitive, and deem it unjust partiality, if not an insult, to say anything against their favorite, the Scuppernong—"*a Divine Gift*"

"Sent in the night time of sorrow and care,
To bring back the joy that the South used to wear."

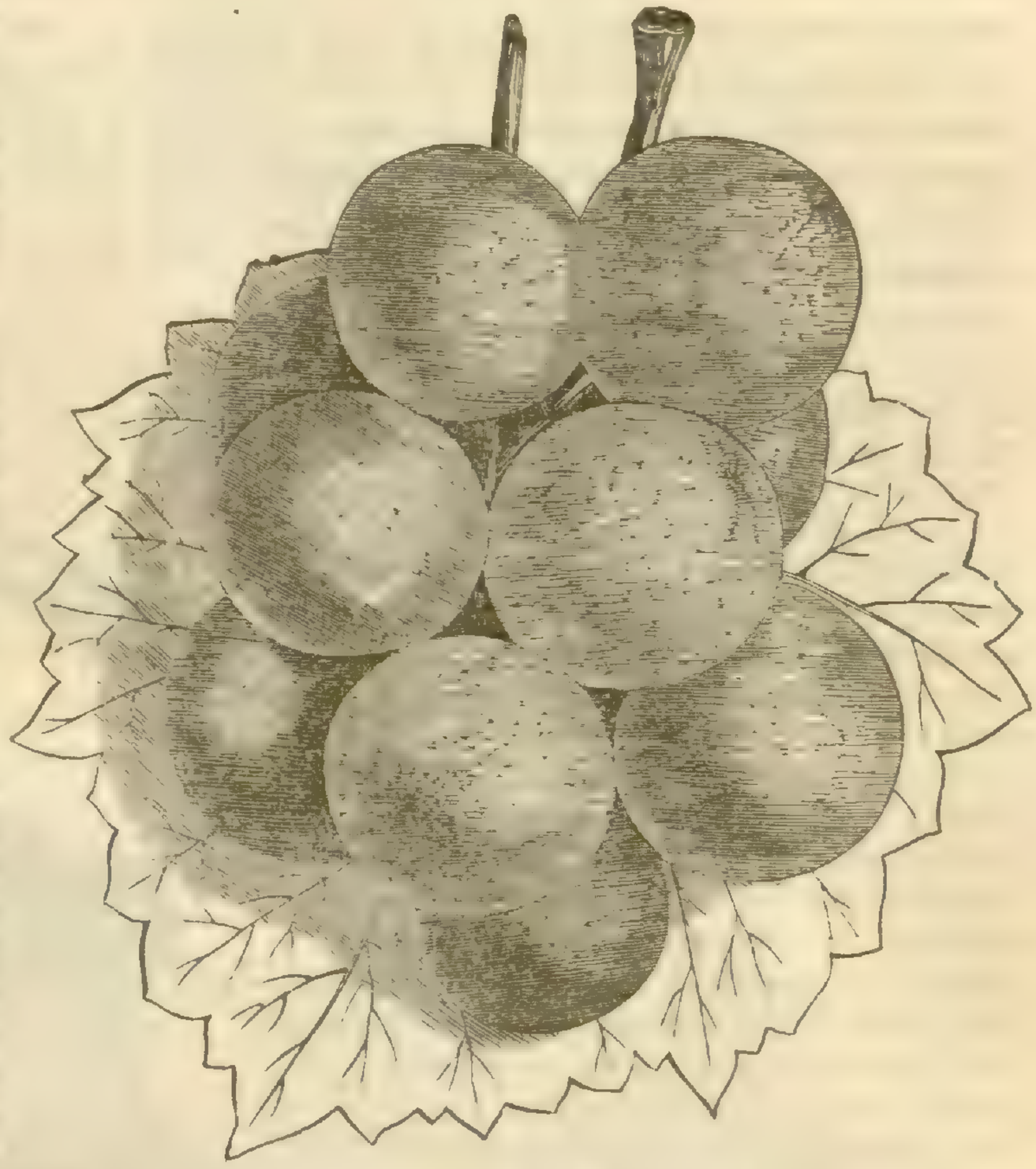
Most heartily wishing that joy be brought back to our afflicted South, we would therefore refrain from any remarks in derogation of this Divine gift, had it not been attempted to palm upon the distressed people of France the Scuppernong as the only salvation for reconstructing their noble vineyards (Le Phylloxera et les Vignes Americaines par M. C. Le Hardy de Beaulieu). We shall quote, however, none but *Southern authorities* and cultivators of the Scuppernong.

P. J. Berckmans, of Georgia: "I could not say too much in praise of the Scuppernong as a wine grape. It is one of those things that never fail. *Of course I do not compare it with the Delaware and other fine flavored grapes*; but the question is, where, where shall *we* find a grape that will give us a profit? We have it in the Scuppernong. It cannot be grown as far north as Norfolk."—*Am. Pom. Society*, 1873.

J. H. Carleton, El Dorado, Arkansas: "The fruit is so healthy that it has never been known to make any one sick, unless he swallowed the hulls, which are very indigestible. I made some Scuppernong wine last year with very little sugar (1¼ lbs. to the gallon must), and although the grapes were not near so ripe as they should have been, it has a fine body. * * * It is called by some the 'lazy man's grape.' I admit the charge and prize it the more on that account."

Jno. R. Eakin, Washington, Arkansas; "I scarcely know what to say of this nondescript, which is called a grape. It is a coarse, tough-skinned berry, with a sweetish, musky flavor. The vine takes care of itself. Does not require and will not suffer pruning; bears abundantly and has no diseases. With sugar it makes a very wholesome and palatable dry wine, and when "tomahawked" with apple brandy (shall I confess it?) is glorious to take. I scarcely think it a grape, but still a most useful fruit *sui generis*, and I hope will be cultivated extensively by those who have no inclination for the more troublesome, and I must say, the more exquisite 'bunch grapes,' as it is the habit of its friends to call the *Herbemont*, the Catawba and others. Each to his taste."

A. C Cook, of Georgia: "It is deficient both in sugar and acid, as it rates at about 10 per cent of the first, 4 per mille of the latter."—*Grape Culturist, July*, 1870.



SCUPPERNONG.

The *Scuppernong* grape was discovered by the colony of Sir Walter Raleigh, in 1554, on the Island of Roanoke, N. C., and the original vine is said to still exist there, being over 300 years of age. In appearance, wood, fruit and habit, it is entirely distinct, or '*unique*' as Mr. *Van Buren* calls it, saying: "There is a resemblance between the V. Vinifera, Labrusca, Æstivalis, Cordifolia; they will all intermingle, producing Hybrids, but none of them can ever be crossed with the V. Rotundifolia, which blooms two months later than either of the foregoing varieties. The odor of the Scuppernong when ripening is delicious, and entirely distinct from the nigger stink of the Fox grape family." (Northerners must not be sensitive!) The growth of the vine, or rather the space over which its branches extend in a series of years, is almost fabulous. The bark of the Scuppernong is smooth, of a greyish ashey color, variegated with many small, dot-like specks of lighter hue; the wood is hard, close-textured, firm; the *roots* white or creamy. The leaves, before dropping in autumn, become of a brilliant yellow.

Bunch or cluster consisting usually of only about 4 to 6, rarely more, large, thick skinned, pulpy berries. These are ripening in August and September; not all at the same time, but are falling off successively when ripe, by shaking the vine, and they are thus gathered from the ground. Color yellowish, somewhat bronzed when fully ripe. The pulp is sweet, juicy, vinous, with a musky scent and flavor—a delicate perfume to some tastes, repugnant to others. With the addition of sugar or spirits, or both, it makes a good, pleasant cordial of fine aroma. The French wine judges at the Congres held in 1874 at Montpellier, pronounced all the Scuppernong wines there "fort peu agréable," some even "d'un gout désagréable."

Senasqua. A hybrid raised by Stephen Underhill, Croton Point, N. Y., from Concord and Black Prince. Seed was planted in 1863 and the vine bore its first fruit in 1865. *Bunch* and *berry* varying from medium to large; the bunch is very compact, so much so, as to cause the berries to crack; color black with blue bloom; quality best. The fruit has the peculiar fleshy character of certain foreign grapes, with a brisk, vinous flavor. The vine is vigorous and productive, in rich soil; moderately hardy. The leaf is very firm, and shows no trace of foreign origin, except when it ripens, at which time, instead of the yellow of the Concord it takes on the crimson color of the mature leaf of the Black Prince. With us, at Bushberg, it did not succeed so well, and is not near as desirable as Underhill's new grapes, the Black Eagle and Black Defiance. The originator himself does *not* recommend the Senasqua as a profitable grape for market purposes, as it is rather late in ripening (a few days after Concord), but only as a fine and valuable amateur fruit. As such it is of first rank, "of the highest quality to those who appreciate life and brilliancy in a grape."—We give in annexed figure, the likeness of a medium-sized cluster.

SENASQUA.

Taylor or **Bullit.** (often called Taylor's Bullit,) (*Cord.*) Introduced to notice by Judge Taylor, of Jericho, Henry County, Kentucky. It is generally considered very unproductive. It seems that the vines of this variety require age, and spur pruning on old wood to make it produce well. Mr. Husmann says:

"Give the vine plenty of room and plenty to do, i. e., prune it long and we think it will bear satisfactory crops when four years old."

We tried it in vain.

Mr. Samuel Miller suggests to plant the Clinton among Taylor to fertilize them, but we find the benefits resulting from this system also insufficient to balance its many inconveniences; and yet we have seen Taylor vines grown by themselves on the "Souche" plan (the shape of a small weeping-willow tree, allowing the canes to grow from the top and not from the base of the main trunk, spur pruning in winter but not suppressing the growth by summer pruning) produce from 5 to 10 lbs. per vine. The *bunches* are small, but compact and sometimes shouldered; *berry* small, white to pale amber, turning even to pale red, like Delaware when perfectly ripe, round, sweet aud without pulp. Skin translucent, very thin but tough. Vine a very strong, rampant grower, healthy and very hardy. *Roots* comparatively few, wiry and very tough, with a thin, hard liber. The young spongioles will push as rapidly as the Phylloxera can destroy them; hence this variety possesses great power of resistance to the insect. Its wine is of good body and fine flavor, more closely resembling the celebrated Riesling of the Rhine than perhaps any other of our American varieties. Some very promising seedlings of the Taylor are now introduced. See *Elvira*.

Telegraph. (*Labr.*) A seedling raised by a Mr. Christine, near Westchester, Chester Co., Pa., and named by P. R. Freas, editor of the Germantown *Telegraph* (one of the best agricultural papers in the East). An attempt

was afterwards made to change its name to *Christine*, but did not prevail. Mr. Sam. Miller, of Bluffton, says it is one of the most promising of all the new EARLY grapes, and we consider it as far better than Hartford Prolific. *Bunch* medium, very compact, shouldered; *berry* medium, oval, black, with blue bloom; flesh juicy, with very little pulp, spicy and of good quality; ripens almost as early as Hartford Prolific. A constant and reliable bearer, but often lost by rot, especially in the Southwest. Vine a healthy, vigorous grower, in rich soil. *Roots* very abundant, heavy, and remarkably fibrous, with thick but rather firm liber. Canes stout, of average length, crooked at the joint, with the usual number of laterals. Wood hard with medium pith.

Theodosia. A chance seedling in the grounds of E. S. Salisbury, Adams, N. Y., said to be an Æstivalis. According to Mr. S. the *bunch* is very compact; *berries* black, in size between Delaware and Creveling, quite tart, very early, and claimed to be a good wine grape. But at a grape test held at Hammondsport, October 12, 1870, the report showed for Theodosia the lowest amount of sugar, 63⅓° by Oechsles' scale, with over 11 per mill. acid.

Thomas. A new variety of the *Scuppernong* species, discovered and introduced by Mr. Drury Thomas, of S. C., and thus described: "In color it varies from reddish purple to deep black; has a thin skin; sweet and tender flesh; is less in size than the Scuppernong, makes a fine wine, and is superior for the table. Ripens with the Scuppernong.

To-Kalon. Syn: WYMAN, SPOFFORD SDLG., CARTER. (*Labr.*) Originated at Lansingburg, N. Y., by Dr. Spofford, and was at first supposed to be identical with the Catawba. C. Downing showed that it was entirely distinct and at first highly recommended it for general cultivation, but soon afterwards found that it drops its fruit, is inclined to rot, does not ripen well, and mildews badly, and so stated; admitting, however, that "this grape is very fine, when you can get it." *Bunch* medium to large, shouldered, compact; *berries* varying in form from oval to oblate, nearly black in color, and profusely covered with bloom; flesh sweet, buttery and luscious, without foxiness in its aroma and with but little toughness or acidity in its pulp. An early but a shy bearer.

Talman's Seedling, or **Tolman.** (*Labr.*) Grown in Western New York, as an early market grape, CLOSELY RESEMBLING HARTFORD. *Bunch* medium to large, compact, shouldered; *berry* large, black, adheres to the stem. Skin thick and firm; flesh sweet, juicy, somewhat pulpy, with slight foxy flavor; vine a very rank vigorous grower, perfectly hardy and healthy and very productive; said to ripen a week earlier than Hartford; quality not very good, yet by some preferred to Hartford. The same variety was said to have been sent out under the name of "*Champion*," as a new variety, but its proprietor, R. J. Donnelly, of Rochester, claims that his "Early Champion" is a *new* grape, ripening two weeks before the Tolman, or any other, and he is permitted to refer to Ellwanger & Barry, Hooker, and other high-standing Horticulturists who have seen the grape growing.

Triumph. (Campbell's Concord Hybrid No. 6.) Is pronounced by Mr. Samuel Miller, to whom Mr. Campbell confided this new variety for testing and propagation in Missouri, as *the most promising of all the white grapes.* It is a cross between Concord and Chasselas Mosquee, (Syn. Joslyn's St. Albans.) Like his *Concord Muscat*, it has retained, even more than this, the vigor and general habit of foliage and growth of its parent; its fruit however, is wholly free from any vestige of coarseness or fox flavor, or smell. *Bunch* and *berry* are very large; color white; skin thin, no pulp; small seeds and few of them; ripens later than Concord, (Sept. 16, here,) nearly as late as Catawba, and on that account not recommended for the North or for any locality where the season is too short to ripen the Catawba or Herbemont, but the more valuable further South; quality first rate; vine healthy and hardy, very productive and free from disease, showing no rot when even Concord rotted more or less. He predicts a splendid career for this variety, and we ourselves wish and hope that its success may justify its name.

Uhland. A new seedling from the Louisiana, raised by Fr. Münch, and considered by him the most hardy and prolific, and consequently the most promising of the lot.

Una. (*Labr.*) A white seedling, raised by Mr. E. W. Bull, the originator of the Concord. Not as good nor as productive as Martha. *Bunch* and *berry* small, of a very foxy flavor; not desirable.

Underhill. Syn. UNDERHILL'S SEEDLING, UNDERHILL'S CELESTIAL. (*Labr.*) Originated at Charlton, Saratoga Co., N. Y., by Dr. A. K. Underhill; pronounced as "of no more value than many other fox grapes" by Mr. Fuller, but considered by G.W. Campbell to be "of more value than the Iona for general cultivation." *Bunch* medium, to large, moderately compact; *berries* full medium, round, of Catawba color; pulp tender, sweet, rich and vinous, slightly foxy; ripens early, about with the Concord; vine a strong grower, hardy, healthy and productive. Not yet tested here.

Union Village. Syn. SHAKER, ONTARIO. (*Labr.*) Originated among the Shakers at Union Village, Ohio. One of the largest of the native grapes we have, and one of the strongest growing vines. It is said to be a seedling of the Isabella, scarcely better in quality, but the bunches and berries are of the *size* of the Black Hamburgs. *Bunches* large, compact, shouldered; *berries* very large, black, oblong; skin thin, covered with bloom; flesh quite sweet when fully ripe, and of tolerably good quality; ripens late and unevenly. Vine a coarse grower but tender, requires protection in severe winters; often unhealthy.

Urbana. (*Labr.*) *Bunch* medium, short, shouldered; *berry* medium to large, round, white-yellowish in the sun, juicy, vinous acid; hard centre, aromatic skin. Ripens about with Isabella.—*Downing*.

Venango, or **Minor's Seedling.** (*Labr.*) An old variety, said to have been cultivated by the French at Fort Venango, on Alleghany river, some eighty years since. *Bunch* medium, compact; *berries* above medium, round, often flattened by their compactness, color pale red, a fine white bloom; skin thick; flesh sweet, but pulpy and foxy; vine a vigorous grower, very hardy, healthy and productive.

Victoria. Ray's (*Labr.*) This new variety is being introduced (1871—1872) by Mr. M. M. Samuels of Clinton, Ky., who describes it as follows: "*Bunches* and *berries* medium size, round, light amber color; skin thin; pulp tender, sweet and highly flavored; vines perfectly healthy; abundant bearer, and a good, but not rampant grower." This grape has been tested for a number of years by a few individuals, in different parts of the South, and has, even under adverse circumstances been free from both mildew and rot; it ripens there about the middle of August, and was pronounced an excellent table grape, making also a superior wine.

We find it quite similar to *Perkins*.

Weehawken. Raised by Dr. Chas. Siedhof of North Hoboken, N. J., from a seed of a grape from the Crimea—*V. Vinifera*. A white grape of fine quality.

Its foliage is very handsome, and decidedly foreign in character; its fruit fine; but only by grafting it on native roots, and careful nursing and covering in winter can we obtain some of it in favorable seasons.

White Delaware. A pure Delaware seedling, originated with Mr. Geo. W. Campbell, of Delaware, O., of whom we received a few vines of this variety in 1873.

The vine is claimed to be much more vigorous and robust in habit than the Delaware under the same conditions and circumstances; its foliage is large, thick and heavy, resembling that of Catawba more than Delaware. With him it has so far resisted both mildew and rot in very unfavorable seasons, and has matured its fruit perfectly when both Concord and Delaware were destroyed. In flavor it seems to Mr. Campbell all that can be desired, even superior to the old Delaware. Its only fault, he says, is want of size; the *berries* and *bunches* will both rather fall below than go above the size of Delaware. In *form* of bunch and berry it is like the Delaware, compact and shouldered; color *greenish-white*, with thin white bloom. Productive, but apparently not as subject to overbear as the Delaware.

If its more vigorous habit should make this new variety succeed in localities where the Delaware fails, then the want of size would not prevent, in our opinion, its becoming a very valuable vineyard grape. We consider it worthy of trial.

Another White Delaware seedling has been raised by Mr. Herm. Yaeger of Neosho; while the bunch and berries closely resemble the Delaware in shape and size, it has otherwise every characteristic of a *Labrusca*.

Whitehall. (*Labr.*) A *new*, early black grape, supposed to be a chance seedling, originated on the grounds of Mr. George Goodale, in Whitehall, Washington Co., N. Y. and said to be nearly three weeks ahead of the Hartford Prolific! Messrs. Merrell & Coleman, who have propagated and now offer this new grape, describe the fruit to be the size of the Isabella; *bunch* large and moderately compact, color dark purple; *berries* thin skinned, and adhering well to the stem; pulp tender, melting and sweet. The vine is said to be a good grower, hardy and free from mildew.

This variety may most likely be worthy the attention of grape growers in search of *very early* sorts.

Wilmington. (?) A white grape, originated on the farm of Mr. Jeffries, near Wilmington, Del., Vine very vigorous, hardy. *Bunches* large, loose, shouldered; *berries* large, round, inclining to oval, greenish-white, or when fully ripe, yellowish. Flesh acid; pungent, not desirable at the north—may be better south. Ripens late.—*Downing*.

Wilmington Red. Syn: WYOMING RED. (*Labr.*) Raised and disseminated by S. J. Parker, M. D., Ithaca, N. Y., and according to Fuller, "nothing more than an early red fox grape, but little better than the old Northern Muscadine." The *Horticulturist*, of Nov. 1874, speaks of the *Wyoming Red* (probably the more correct name of Dr. Parker's red fox grape seedling) as being rapidly diffused and much in demand there, as an *early* profitable grape.

Winslow. (*Cord.*) Originated in the garden of Charles Winslow, Cleveland, O. The vine resembles Clinton, is hardy and productive; the fruit matures very early, and is less acid than Clinton; *bunch* medium, compact; *berry* small, round, black. Flesh reddish tinge, some pulp, vinous, juicy.—*Downing*.

THE WALTER GRAPE.

Walter. (*Labr.*) Raised by that enthusiastic horticulturist, Mr. A. J. Caywood, of Poughkeepsie, N. Y., crossing the Delaware with the Diana. From the many premiums awarded to this grape, from the favorable reports by all who have seen or tested it for wine, it may well claim to be a first class grape, and to merit a trial wherever American grapes are successfully grown. It labors yet under the disadvantage of having been represented as the climax of perfection, or, at least, as being superior to all other American varieties, by its originator. In justice to the latter, however, it must be admitted that he honestly believes all he claims for his seedling, and has distributed the same with a liberality and a disinterestedness scarcely ever equalled by any originator of a new variety. It is now growing in almost every soil and location of this Union, and the opinions on its true merits and adaptability for general cultivation widely differ according to localities. In those where vines are much subject to mildew, the Walter cannot flourish, it drops its foliage, and is far from desirable; but in favorable localities, especially where the Delaware succeeds well, there the Walter will also prove desirable—a fair grower and good bearer. Even in less favored localities it proved healthy and gave splendid results—when grown on Concord or other vigorous roots, while on its own roots it failed.

In general appearance the characters of both the Diana and Delaware are discernible. The *bunch* and *berry* are of medium size, of light Catawba color. Flesh tender, rich and sweet, with an agreeable spicy flavor, strongly reminding of the Diana. The fruit is possessed of a most exquisite and delicate aroma, and a bouquet equalled by no other American grape that we know of. Quality best, both for table and for wine. Ripens very early, about same time as Delaware. Vine, in moderately rich sandy soil, where free from mildew and from Phylloxera, a very fair grower, with dark brown, short-jointed wood; large tough leaves, green on the upper and lower surface, not woolly; must 99° to 105°; acid 5 to 8 per mill.

Wilder. (Rogers' Hybrid No. 4.) This promises to be one of the most profitable and popular varieties for the market in cultivation, its size and beauty being equalled by its vigor, hardiness and productiveness. *Bunch* large, often shouldered, sometimes weighing a pound; *berry* large, globular; color dark purple, nearly black; slight bloom. Flesh tolerably tender, with a slight pulp, juicy, rich, pleasant and sweet. Ripens with, and sometimes earlier than the Concord, keeping for a long time. The vine is vigorous, hardy, healthy and productive; *roots* abundant, of medium thickness, straight, with a smooth, moderately firm liber. Canes heavy and long, with well-developed laterals. Wood firm with a medium pith. The figure of the Agawam (page 34), and of the Senasqua (page 75), may serve as fair illustrations of the form and appearance of the Wilder grape.

Wylie's New Seedling Grapes. "Too much can scarcely be said in praise of Dr. Wylie's persevering efforts in the improvement of the grape."—*P. J. Berckmans, Chas. Downing, Thomas Meehan, W. C. Flagg, P. T. Quinn,* Committee on Native Fruits, of the Am. Pomol. Society. (Proceedings 1871, page 54.)

This testimony, and the excellent character of these hybrids, as regards flavor and general appearance, entitle them to special attention; and we give them a place in our Catalogue, although they have not been sufficiently tested, and we are now growing them under restrictions not to sell or give out any wood of same. But as soon as they will have been sufficiently tested in different localities and proven satisfactory, their originator will distribute them with great liberality, though few persons can appreciate the immense labor and perseverance which his experiments have cost. As early as 1859 he had raised many seedlings of Delaware and Foreign; all have proven failures. Catawba, Isabella, Halifax, Union Village, Lenoir, Herbemont, and other hybrids, which he produced by crossing any of those with foreign, have nearly all failed—most of them from mildew and rot. Many would produce vines of healthy appearance, but they would fail to set their fruit. In 1863 he had over one hundred promising seedlings; gave Mr. Robert Guthrie, of York County, S. C., about 65, mostly hybrids of *Halifax* and *Delaware*. These flourished, and never missed a full crop; but after some years Mr. Guthrie had to be absent, and the vines were entirely neglected. Mr. Wylie's own soil is a tenacious pipe clay, the worst for grapes, and during the war, owing to quartering of troops adjoining his lot, his vines were ruined. Thus there exist now but a few of those *Halifax and Delaware* Hybrids saved again by Mr. Guthrie. In 1868 Mr. Wylie planted about one hundred seedlings of *Concord* fertilized with foreign, and about fifty Diana fertilized with West's St. Peter, white Chasselas and Lady Downe's Seedling. Of these many mildewed badly, some died, and he abandoned them. After many failures to produce seedlings of Hybrid-Scuppernongs, he finally succeeded, but owing to a little hot house being over-heated, he again lost nearly all of them. He commenced anew with his experiments and had hundreds of new seedlings growing, when they were cut down by a severe frost, on the 27th of April, 1872, a frost which killed all kinds of grape vines in that section. Again, in November, 1873, his residence was burned, (no insurance) and consequently he had to leave his place to depredations from broken fences, &c. But it is now rebuilt, and Mr. Wylie is back again at his old place, experimenting and working with the same zeal and enthusiasm as ever, wishing:

"If I were only young again—with the experience I have!"

We extract the following from Mr. Wylie's letters to ourselves, feeling confident, that it will be found interesting to grape growers, as characteristic of the originator and his new Hybrids. "I send you some scions for grafting, of some of my best Hybrids. I wish you to give them a fair trial. I hardly think that any of them will prove tender with you, except 'Jane Wylie.' Those which I found most hardy, and judge to be so also North (from parentage), I mark *. In describing my different Hybrids I always name the female parent first, viz: *Halifax* and *Delaware* means that Halifax is the female and Delaware the male parent."

Jane Wylie. (Parentage, Clinton and Foreign.) *Bunch* and *berry* very large; berries nearly one inch in diameter; quality *best*. resembling foreign in texture and flavor, ripens early and hangs long; might require winter covering in your climate and further North.

* **Clinton** and **Foreign**, (Red Frontignac,) **No. 6.** White, slightly red on cheek; resembles white Chasselas; *bunch* large; *berries* above medium; not as early as Jane Wylie; wood and foliage NATIVE; seems quite hardy, and is of highest quality.

Harry Wylie. A Hybrid, (label of parentage lost) white; *bunch* and *berries* about size of Lenoir, more shouldered; beautiful and excellent.

* —— **No. 4.** A cross between two Hybrids. *Bunch* some larger than Lenoir; *berry* medium, of a clear transparent golden color; finest texture and flavor, resembling white Frontignac. Ripens as early as Concord; native foliage. but ahead of all American grapes in quality; considered of the highest excellence by Downing, Saunders, Meehan and others.

* —— **No. 5.** (Delaware and Clinton). *Bunch* and *berry* larger than Delaware; color of fruit a fine pink. "Berckmans writes me that it bore well with him (scarcely any grape does well on his soil). says it is as strong and healthy a grower as Clinton (stronger with me); he thinks it of promise, and worthy a name. I am anxious for you to try it. Foliage native; does not rot or mildew here."

* **Garnet.** (Red Frontignac and Clinton.) *Bunch* and *berry* larger than Clinton, of a beautiful deep garnet color; flavor and texture foreign, but native foliage.

Concord and **Foreign** (Bowood Muscat,) **No. 8.** Black; *bunch* and *berries* very large and loose; skin thick; texture foreign, flavor slightly musky. A strong grower with large Labrusca foliage. Ripens as late as Catawba.

Halifax and **Hamburg, No. 11.** Black. *Bunch* and *berry* medium size; skin thick; only valuable on account of its extreme productiveness and health; has never rotted in ten years.

Peter Wylie No. 1. (Parentage: F., Halifax and Foreign, M., Delaware and Foreign.) White; transparent, becoming golden yellow when fully ripe; *bunches* and *berries* between Delaware and Concord. A vigorous, short-jointed, rapid growing vine, with thick, native leaves; holds its leaves and ripens its wood thoroughly. (Also Peter Wylie No. 2, produced from seed of P. W. No. 1.)

Robert Wylie. Blue; *bunch* large and long; *berry* large; skin thin; rich and juicy; ripens as late as Catawba. A great bearer; one of my best, but it may not be quite hardy, as the wood is not very hard.

Gill Wylie. (Concord and Foreign.) Blue; *bunch* large, loose, and much shouldered; *berry* large, oblong; texture soft and rich; ripens with Concord, but altogether superior. Intensely Labrusca in foliage, and clear of all disease. Considered of *greatest promise.*

* **Delaware** and **Concord No. 1.** Dark red; *bunch* and *berry* medium; skin tolerably thick; juice rich and sweet, slightly musky; vine very hardy, with Labrusca foliage; a great bearer, never fails, and may make a fine wine grape.

Herbemont Hybrid. (Halifax and Foreign No. 1 and Herbemont No. 2.) Dark blue; *bunch* and *berry* medium; one of the most tender, sweet, and high-flavored grapes in the collection. A healthy vine, hardy here.

Hybrid Scuppernong No. 5. (Parentage: F., Bland Madeira and Foreign No. 1; M., Stamminate Hybrid Scuppernong; produced by impregnating Black Hamburg with Scuppernong.) So, you see, it is only a quarter blood Scuppernong. I have never yet had a half breed Scuppernong to bear perfect fruit. The vine is healthy and hardy here; it bears a *white*, transparent, fruit. *Bunch* medium, *berries* large; skin thin, but tough; almost pulpless, rich, sweet, with a peculiar flavor; appears to ripen its berries together (as early as Concord) and adhere well, which some of the Hybrid Scuppernong do *not*. I think it may suit your climate; it is certainly worthy of a full trial.

Halifax and **Delaware No. 30.** Color of Delaware; *bunch* about same size; berries one-half larger; texture and flavor also much like Delaware, but holds (here) its leaves better, and is healthier generally, with leaves somewhat hoary underneath. A great bearer.

Halifax and **Delaware No. 38.** Of deeper red color than the former, and of superior flavor, but not as strong a grower as No. 30. Wood hard, leaves hoary, and ferruginous (rusty) underneath. Mr. Guthrie tells me that this variety was the most preferred among about 80 Hybrids he had bearing.

Halifax and **Hybrid No. 55.** Blue, like Halifax, but high-flavored, tender and very sweet; *bunch* and *berry* larger than Nos. 30 and 38. I think it will prove a great acquisition.

I have sent you nearly all of my Hybrids that may be sufficiently hardy for your climate. There are two more which I would like for you to try, but the vines were so nearly destroyed that I have no wood worth sending. I still continue to Hybridize, more or less *every year.*"

A. P. WYLIE.

York Madeira. Syn. BLACK GERMAN, LARGE GERMAN, SMALL GERMAN, MARION PORT, WOLFE, MONTEITH, TRYON. An old variety, probably a seedling of Isabella; originated at York, Pa. *Bunch* medium sized, compact and generally has a small shoulder; *berry* of medium size, roundish oval, black, thickly covered with a light bloom; juice slightly reddened, sweet, vinous, not very rich; skin somewhat pungent and not much toughness in its pulp when fully ripe, which is about same time with Isabella. The vine is not very hardy, short-jointed, moderately vigorous and productive, but often losing its leaves, and consequently failing to ripen its crop. Charles Canby of Wilmington, Del., introduced the same variety as *Canby's August*. *Hyde's Eliza* (Catskill, N. Y.,) is probably also the same grape.

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